

RECORD

200 R 57 44653 - 45120

Book 71

Begin # 44653

End # 45120

Collection and Field Notes

No. 71

(Jan. 1, 1934 - Jan. 31, 1934)
(44653 - 45120)

..... Washington to New Orleans

Texas
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(from Jan.)

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Collection and Field Note Book

No. 71

(Jan. 16, 1964 - Feb. 9, 1964)
(44653 - 45120)

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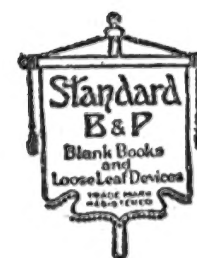
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Book 71

Begin # 44653

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Pacific Vegetation Project
c/o National Research Council
2101 Constitution Ave., N.W.
Washington 25, D. C., U.S.A.

Jan. 16 - Flight - Washington
(Charlottesville) to New Orleans -
inside Boeing 720.

Ground snow-covered.

10:26 Take-off to west or southwest.

Rows of *Juniperus virginiana*
conspicuous along roads
and fences. About 10% or
perhaps more, in patches
of woods - mostly deciduous.

But with many patches
of *Pinus virginiana* in
the hardwood areas -

These almost all angular
patches, occasional diffuse
areas of concentration of
pine in the hardwood - but
the angular patches mostly
dense and black.

10:35 maintaining same
course, the patches of hardwood
become more and more

mixed with pine. Now
dominantly mixed forest
but still with angular
patches of pine.

10:35 Visibility poor, then now.

10:57 An extensive and confused
mass of mountains, with a
very complicated reservoir.

Several larger ranges in
middle and far distance.

10:59 Larger mts. just to rt. of course.

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no visible
all the way

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ith

na

These mostly covered by deciduous forest. Some pine, mainly angular patches, on lower mts. which have much of forest cleared.

11:00

Larger mts. diverge to it. On both sides of them piedmont type of landscape with much clearing, much deciduous forest, and much pine in angular patches. - perhaps about $\frac{1}{3}$ of each type, pattern very small irregular patchwork (from 31000').

11:13

Mts. are at a considerable distance now.

A high isolated peak just to it, of course in piedmont.

11:04

A large winding river just s. of this peak.

11:09

Mt. range swings a bit closer.

11:06-09

Small bits of mountain in piedmont, gradually becoming more numerous and coalescing into a mountainous area, trending toward main range.

11:10

Another large river.

11:19

Capt. mentioned Spartanburg but could not see it.

Many reservoirs. Red soil in extensive cleared land. almost no snow now.

1:02

Appr. landing at New Orleans. Just before end of runway a large area of apparently undisturbed swamp - trees almost touching, standing water. Before that a lake with much aquatic vegetation, mostly submerged and floating, a few bushes

La Coppelton
Guillo Ponscur
Gronique

(rain) (no sun all day)

lecture in

(10 mi. +)

ngl.

inians

reer rounded

? This on high clay soil.

tation is an

crab, Prosopis,

incl. Celtis pallida,

and some higher

closed forest of Celtis, with

some gum - virginians,

undergrowth of Cordalia;

Prosopis, acacia, etc.

Sandy areas are in grass.

Great flocks of little brown cranes.

La Cooperativa
Carilo Pouscar.
Enriquez

These mostly covered by deciduous forest. Some pine, mainly in angular patches, on lower mts. which have much of forest cleared.

11:00

Larger mts. diverge to it. On both sides of them piedmont type of landscape with much clearing, much deciduous forest, and much pine in angular patches. - perhaps about $\frac{1}{3}$ of each type, pattern very small irregular patchwork (from 31000').

11:03

Mts. are at a considerable distance now.

A high isolated peak just to it, of course in piedmont.

11:04

A large winding river just s. of this peak.

11:05

Mt. range swings a bit closer.

11:06-09

Small bits of mountain in piedmont, gradually becoming more numerous and coalescing into a mountainous area, trending toward main range.

11:10

Another large river.

11:19

Capt. mentioned Spartanburg but could not see it.

Many reservoirs. Red soil in extensive cleared land. almost no snow now.

1:02

Appr. landing at New Orleans. Just before end of runway a large area of apparently undisturbed swamp - trees, almost touching, standing water. Before that a lake with much aquatic vegetation, mostly submerged and floating, a few bushes emergent.

1:33

Left New Orleans. (rain) ^(no umbrella all the way)

4:02

Left Houston (rain). (Chicken coop architecture in great tracts).

Jan. 16. Linton (10 mi. s.)

Welder W.P. Refuge.

Quercus virginiana woodland. Trees rounded about 8m tall. This on high ground, dark clay soil.

General vegetation is an open thorny scrub, *Prosopis*, *Condalia*, etc. incl. *Celtis pallida*. In ravines and some higher areas open to closed forest or woodland of *Celtis*, with some *Quercus virginiana*, undergrowth of *Condalia*, *Prosopis*, *Acacia*, etc.

Sandy areas are in grass.

Great flocks of little brown cranes.

Jan. 18 - Welder W.L. Refuge
2 photos near hq. -
Prosopis savanna - coppice type
mesquite 3-4 m. tall, one live
oak tree (b+w). Extensive
type here, merging to
live-oak woodland.

3 photos (b+w) of *Condalia*
deciduous than scrub.
near Mosby Creek.

2 photos (b+w) of savanna
with a few scattered clumps
of mesquite and *Xanthoxylum*
(?) and very low patches of
mesquite and *Opuntia*
cf. *leptocaulis*, near Lagarto Tanks.

photo (b+w) *Arundo donax* just
s. of Javelina Bend.

photo along terrace, same
place, *Acacia farnesiana*
open of scrub forest in hq.

subfossil snails
same place.

River terrace forest of
Celtis reticulata, *Elaeagnus*,
Lycium?

Jan. 18 - Welder W.L. Refuge
near headquarters

Scattered *Quercus*
virginiana, patches of
open grass, patches
with open to semi-closed
mesquite brush.

Under the live-oaks
and to some extent under
the larger mesquite bushes
a shrub layer of ~~scrub~~
mostly evergreen usually
springer prickly bushes
of *Xanthoxylum* *pauciflorum*,
Ulmus spinosa, *Berberis* (s.),
Opuntia leptocaulis, *Elaeagnus*,
etc. (photos b+w & b+d.)

Also under these trees
green seedlings and
rosettes of *Urtica urens*,
Stellaria media, *Panictaria*,
Bowlesia, *Oxalis*, *Geranium*,
etc.

Photo of an "ant yard"
an open space, kept completely
clean, by *Pogonomyrmex* sp. (?)
(large, red) (b+w. b+d.)

Annuals springing up in
great numbers after the heavy
rain on Jan. 15. *Hedyotis*,
Aphlopphus, & *Oxalis* beginning
to flower.

6 1964 Texas

Jan 18 - Welder Wildlife Refuge
Javelina Bend, Aransas R.
in open to closed scrub
forest, mixed deciduous
and evergreen

- 44653 *Celtis spinosa* var. *pallida* (Tonn.) M.C. Jtn.
common
54 *Ehretia anacua* (Berl.) L.M. Jtn.
common

Jan. 18 Welder Wildlife Refuge
Moody Camp
live-oak woodland

- 55 *Tillandsia recurvata* L.

Jan. 19 - Welder Wildlife Refuge
near headquarters
irregular open woodland
of *Prosopis glandulosa* and *Quercus virginiana*
56 *Zanthoxylum fagara* L.
common in shrub layer under
oak trees

- 57 *Zanthoxylum fagara* L.
common in shrub layer
under oak trees

- 58 *Hedyotis caerulea* var. *minor*
rare on open bare soil.

Jan. 19 - Welder Wildlife Refuge
Hackberry Mott, along Aransas River

- 59 *Phoradendron serotinum* cf. var. *pubescens* (Engelm.) M.S. Jtn.
parasitic on *Celtis*, in
scrub forest.

7

shiny shrub 3 m. tall

small tree 5 m. tall

forming balls on twigs
and small branches
of trees.

shrub, 2 m. tall, aromatic
when broken, buds maroon

shrub 2 m. tall, aromatic
when broken, buds bronze-green

flower violet, eye slightly
reddish.

flowers green, trimerous.

Jan. 19. Welder W.L. Refuge
Hatchberry Mott, Arkansas

in Mott is a scrub
forest - in this case
a forest of *Celtis* about
15 m. tall, closed or almost
so.

iniquitescens

Understory of evergreen
shrubs: *Ga. thurberi*,
Celtis spinosa, *Candelia*
obovata, *Thurberia*, - plus
some deciduous ones.

Openings + semi-shaded places,
if slightly low, are covered
by a pure stand of *Aster*
spinosus.

Photo of *Tillandsia recurvata*. (bot.)

Pecan Mott - a broad
swath ravine with tall
Celtis, *Carya illinoensis*,
Ulmus crassifolia etc.
on sides - up to 15 m. (photos)
open somewhat grassy
bottom. Brushy flats
beside it.

Many shrubs in
undergrowth.

Cardinal woodcock, Phoebe,
Mocking birds, thrashers,
hermit thrush, and swarms
of miscellaneous sparrows.

American egret on river.

On upper part of side of
ravine a low, almost
mat-like layer of *Malpighia*
glabra partially covers
the ground.

Jan. 20 - Welder Wildlife Refuge

in sect. 44 lot 11. Kod. photo
of a flock of turkey hens.
another of deer.

Near Mesquite Tanks -
in open shrub savanna
dominantly grass but
with scattered *Opuntia*
hindsheimii and bushes
of low (2.5 m.) *Prosopis*, clumps
of *Opuntia leptocaulis*,
and small *Acacia farnesiana*,
with scattered patches
of an evergreen to semi-evergreen
than scrub of *Berberis*
trifoliata with some ~~the~~
Celtis spinosa and a
little *Opuntia leptocaulis*.
This scrub varies from
dense to open.

dense
black
clay
soil

A number of photos (6 x 4
kod. of this and Kod. 1 roll) and
views of savanna + of scrub
and of some individual
plants incl. *Berberis* +
Opuntia leptocaulis + *hindsheimii*.

Jan. 19 - Welder Wildlife Refuge
Pecan Mott, along Aransas River
on flat open roadside,
almost bare soil.

- 44660 *Euphorbia* cf. *serpens* HBK.
common locally
- 61 *Verbena* cf. *bipinnatifida* Nutt.
common locally
- 61a *Leonurus sibiricus* L.?
same - in open to closed forest
- 62 *Diospyros texana*
common
- 63 *Baccharis angustifolia*
occasional ~~in~~ steep bank of river
- 64 *Tillandsia usneoides*
common ~~on~~ hanging from
branches of trees

Jan. 19 - Welder Wildlife Refuge
Hackberry Mott, Aransas River

- 65 *Amyris texana*
common in undergrowth

Jan. 19 - Welder Wildlife Refuge
Pecan Mott, Aransas River

- 66 *Carya illinoensis*
common in forest in swaly rain

very prostrate, thin mat.
stems reddish.
prostrate, flowers
purple.

sterile shrub, to 3 m. tall.

shrub 3 m. tall, 4 cm. thick
near base, broad leaves on
lower branches, branches
strongly ascending.
pendent

shrub with a somewhat
skunk-like odor when broken.

small tree, 4 m. tall, (others
seen to 15 or more m.).

Jan. 20 - Weldon W. I. Refuge
 ex. of Chico Tank and
 Coyote Mill.

Again sight area of
 a grassland with
 thickly scattered low
 patches of low creeping
Prosopis glandulosa and
Opuntia leptocaulis
 Each (or most) clump
 of mesquite, 2-5 m.
 across is filled with
 a dense growth of *Opuntia*.
 The whole 0.5-0.8 m. tall -
 scattered in this are a
 few *Opuntia lindheimeri*
 and *Berberis*, also a few
Acacia, but these not
 very significant.

The grass is mixed very
 short and up to 1 m.

Photos (b & w. & Kod. Begon Kod. - 2)

Tule Bend, Aransas R.

Terns with light gray
 back, black eye patch
 & bright red bill.

Bet.

and Tule Bend a semi-
 evergreen open to closed
 thorn scrub -

Acacia rigida, *Celtis*
spinosa, *Condalia*
Lycium berlandieri, *Berberis*,

Baccharis? *Yucca*,
Xanthoxylum bagara, etc.

Near Mare Trap Pens
 first an enormous old bran
 peccary crossed road
 and disappeared into thick
 thorn scrub. Then 3 medium
 sized ones were seen ambling
 through thin low thorn scrub.

In La Bolsa the ground
 is low and black. Open
 forest of rounded *Celtis*
 trees to 4.5 m. tall. Patches
 of open *Acacia farnesiana*
 about 4 m. With the
 large *Celtis reticulata* are
 small trees of *Celtis spinosa*.
 Large *Opuntia lindheimeri*
 common. (photos - b & w & Kod
 of this area) Some *Acacia*
rigida.

Tight wire bridge - a
 single cable with 2 hand
 wires, suspended across Aransas R.
 (Kod.)

Patches of *Aster spinosus*,
 a leafless boom-like shrub
 1 m. tall, in low spots.
 (photos - b & w.)

Jan. 20 Welder Wildlife Refuge
Tule Bend, Arkansas R.

in semi-evergreen thorn scrub

2x44667 Aster
on bare ^{black} clay soil ^{in depression} along road.

72 68 atriplex
common on bare black clay soil
along road

74 69 Wissadula holosericea (Scheele) Parke
common in very small opening

72 70 Baccharis
abundant locally

72 71 Lycium berlandieri
occasional

Jan. 20 - Welder Wildlife Refuge
e. of La Balsa, Arkansas River

73 72 Aster spinosus
pure stand in low place.

Jan. 20 - Welder Wildlife Refuge

71 73 on roadside on dark clay soil
common

disk yellow, rays pale lavender

prostrate, gray-green,
stems reddish.

branched at base 0.4 - 0.7 m. tall

shrubs 0.5 - 1 m. tall,

- disk greenish yellow, rays white.

rigidly branched

shrub 0.3 m. tall. fruits
turning red.

broom-like, leafless shrub
1 m. tall.

prostrate

Jan. 20 - Welder W. C. Refuge

ravine below Rincos Tanks - Area of semi-evergreen thorn-scrub, open to closed, with some small *Croton* trees in and along edges of ravine.

Near Lagarto ^{Windmill} ~~Point~~ is an area of minutely rolling or hummocky ground - dark clay loam soil, with patches of dwarf thorn scrub - *Prosopis* - *Opuntia*, & patches of taller thorn scrub. small depressions, no evident pattern except that the earth may have accumulated around the scrub.

Short grass between the scrub patches, esp. on the elevations. Mud, less so in the depressions. Jack rabbit seen there.

Several groups of 3 little brown cranes flushed during the afternoon.

Mail - Pine Island
 #10 Galapagos Expedition
 #6 USS Pine Island
 AV
 TPO San Francisco

Jan. 21 - air trip Houston
Texas to Guatemala City.
DC-8, rt. side back of wing!

10:35 left Houston airport.

10:38 Cultivated land but
with conspicuous gallery
forest, locally deciduous,
locally evergreen, along
meandering stream.

10:39 Some blocks are pastures,
some cultivated. Much burned
over grassland.

10:41 Mostly dry pasture.

Then salt marsh lining a
coastal lagoon, enclosed
by a barrier beach.

Course turned rt. to follow
coast.

10:43 A shipping canal follows
inner edge of lagoon.

Several small subdivisions
on barrier beach island.

10:44 Visibility almost none.

We seem to be following
the coast just off the barrier
beach.

11:44 Plain, largely but not
entirely cultivated.
several large lakes

11:45 and a large meandering
river with general course
from about 45° to rt of
our course.

11:46 apparently swampy

land along small
meandering stream.
then a large patch of
woods that seems hilly -
several such, with brow
cleared partly cultivated
land between them.

11:49 Country generally cleared
mostly pasture (brown) but
large irregular angular
patches of forest. Some
hilly areas badly eroded.
11:50 Small very meandering
stream at angle, about
 60° back, from course.

11:51 Country becomes hilly,
but hills mostly denuded.
Fine patchwork of shifting
agriculture. Rugged mts.
in distance.

11:53 Very rugged mts. with
knob-like peaks and deep
canyon-like valleys.
Appears to be last remnants
of a dissected plateau. Highest
areas are forested, slopes
all denuded by shifting
agriculture.

11:54 Sharp ridges with roads
or paths on tops, steeper
slopes wooded, mostly
shifting agriculture.
11:56 Dissected plateau, flatter
part denuded, some peaks densely forested.

- 11:57 Plateau becomes arid, grass or thin brush, cut by deep jagged canyons, trending back from coast at about 45° .
- 11:59 Plateau mostly pasture, a little cultivation. some very eroded areas, steeper slopes very brushy.
- 12:00 Very rugged mts. seriously eroded, parts are still densely wooded, but only most rugged parts, these with granite pinnacles protruding. Cleared areas are mostly just great erosion scars.
- 12:01 The central basin-like plateau, with a fair sized city. Savanna landscape. Flat cultivated areas. Low mound-like dark hills. Uncultivated areas are mostly grassy with scattered trees. These are the hilly parts. Vast flat valley bottoms are all cultivated.
- 12:04 Thinly wooded low mountain in middle and

- 12:05 far distance to right. Around villages, roads and field boundaries marked by hedges. Landscape tawny.
- 12:06 Areas of green large scale planting (sugar?), brown cultivated land, some orchard (citrus?), pasture with scattered trees. Hedges conspicuous near villages.
- 12:07 Large area of savanna, partly in apparently poor orchards. Then large area of pasture without trees.
- 12:08 Crouching for landing. Vast spirally divided ponds - green. What is this? Then apparently saline dry flats with no vegetation - a lake bottom, I guess. Then considerable area covered by water, this very shallow. Continues to near airport over vast marshes with brown grass and patches of reed, ponds covered by green vegetation.
- 12:12 Landed. In garden at terminal two great *Phytolacca dioica* (?) with enormous swollen bases 2-3 m. across.

- 1:07 ~~from~~ left Mexico City airport.
Circled over large lake
and alkali flat.
Gentle slopes around it
cultivated, in places terraced.
- 1:10 A string of cones with
craters extending to right.
Eroded ash beds almost
like haystack at their bases.
- 1:11 Flat area intensively
cultivated the small
fields lined by hedges.
- 1:12 Higher open forested
country, with many
small cones with craters.
The slopes wooded,
bottoms of craters and
some flat areas between
~~are~~ grassy.
- 1:13 Flat country, cult.
with mountain
ranges, some rugged.
They thinly wooded.
Valley bottoms flat,
cultivated - green (sugar
cane?).
- 1:14 Several lakes in distance.
Country generally brown.
High rough mts. beyond
lakes.
- 1:15 Changed course sharply
to left.
- 1:16 Hilly denuded country,
hilltops and ridges

generally bare, some brush
in ravines and on steep
slopes. This very extensive.
Ridges generally rather
flat-topped.

This landscape continues
for some time, the contrast
between wood and bare
ridges becoming sharper.
several wide treeless
valleys separated
by wooded ranges.
Same pattern of bare
ridges and wooded
ravines.

1:25

1:30

1:34

1:39

1:37

Then a large wooded
mountainous area.

Bare eroded hilly
country, reddish-tan,
around a compact little
city.

Low mts. to south of it.
Dark, apparently scrub-
covered. Flat intensively
cultivated land around
them. Mountains irregularly
distributed, becoming
higher, rougher, more
forested. Lower land
cultivated or, where
hilly, eroded.

Valleys smaller & little or
no flat ground, slopes denuded,

summits scrub covered
or wooded.

1:38

Then thinly wooded
mountains, ridges
mostly bare.

Course is now more to
east.

Mountains becoming
more rugged.

1:40

Many cleared patches
on mts. even a village
on a high ridge.

1:41

A stream, mostly dry,
cuts through mts
about perpendicular
to course, conspicuous
light sandy bed.

Then high rugged
mts. more densely
wooded in upper parts.
Lower parts with bare
ridges, thinner woods.
several fires.

1:42

Course follows a stream
bed. These sandy,
dry or partly dry beds
stand out against the
brushy slopes.

1:43

Stream empties into a
large lake or reservoir
with three arms.

Mountains around it
with tops denuded,
grassy or eroded.

1:45

Large braided stream
bed from reservoir
parallel course in
middle distance, slightly
diverging from it.

1:46

Stream enters sea,
on a strongly cusped
coast, cusps hooked
to left (s.e.?)

1:47

A large lagoon enclosed
by a broad barrier beach.
Back of this a flat
cultivated plain.

Small steep islands
in lagoon.

An arcuate inner
bar almost parallel
barrier beach ~~for~~ almost
full length of lagoon,
connect with a larger
island which is separated
from a mountainous
peninsula by a small deep
channel. Then another large
lagoon. The barrier beach
cut by some shallow channels,
then broadens enormously,
enclosing a series of small
shallow lagoons. Some
shifting agriculture on
this barrier beach, but
mostly brush. inner side
in places curiously striate,
perpendicular to lagoon shore.

~~1:46~~ This merges with a coast with extensive dry lagoons or bare flats, with a wooded barrier beach, then more lagoons. Barrier beach is wide and bushy, with occasional roads from lagoon to sea. Vegetation more or less banded longitudinally. Lagoons become more complicated with numerous small flat islands. Then we left coast, out to sea.

2:07 Cut a long straight coast at a very small angle. Beach with large swamp. This pinches out, replaced by flat plain, partly cultivated, partly savanna and abundant patches of forest, mostly very small. This plain is quite wide, cut by many streams flowing toward ocean. Now becomes hilly, with more forest, but still largely cleared. Gradually more wooded. Clouds.

2:14 A slightly complicated top of a volcano protruding from clouds, wooded to top, but ~~top~~ ^{summit} vegetation a bit thin and scrubby. A grassy area on one side below summit.

2:17 A deep valley with terraces and another steep cone with no craters, wooded to top but not on lower slopes, a deep blue lake.

2:18 Then two perfect cones, again wooded to tops. Lower slopes bare. Plateau with cliffs to lake.

2:20 Deep gorge-like valley then dissected plateau, most of top clear, gorge wooded. Then ahead two much higher cones and a bit to left another.

2:21 ~~At~~ Terrace top cleared, with windbreaks, valleys + steep slopes forested. Then hilly brown country. Another volcano ahead. Most of hilly area clear but some with scattered trees, some patches of forest. Then a dissected mt. and a large area of forest around a town.

2:24

2:25

More wooded mts.
lower slopes clear
with radial wooded
canyons.

Circling to land.

Large irregular volcano,
top apparently blown
out, in distance.

Flat cultivated land.
Lake beyond escarpment.
Some sugar cane.

Flat tops cultivated,
some in orchards.

Ravine walls with
thickets & open scrub.

2:28

landed.

Jan. 21 - flight Guatemala City
to Panama left side of Boeing-

4:15

Took off.

Some open forest - no shade trees
for coffee, on terrace tops. also in flat

4:17

canyon bottoms. Some of lower
terrace tops open grassland.
Steep, almost vertical
walls are wooded.

4:19

Very dissected land, no
flat ridge tops. Slopes largely
wooded, much of wood
could be coffee plantation.

4:20

clouds.

4:21

Valley V shaped, about 45° slope,
some bar, mostly wooded,
but rather thinly.

4:22

Hilly country, largely denuded,
many tiny bits of wood.
Where hills are higher
ravines are wooded at
least in bottoms. Country

4:24

varies from a reddish
to grayish-tawny. Much
old erosion, some bedrock
exposed. Soil reddish,
bedrock light gray to buff.

4:25

Perfect little cone with tiny
crater in top. Top 1/3 wooded,
in middle distance, directly
aboard, another, less well
preserved farther away
and a bit back.

4:26

Country a bit more rugged,
small town and considerable
forest between it and course.
Beyond it, ~~also~~ in direction

of course, some curious
very finely dissected country.
Then a series of parallel
ridges and ravines 60° from
course, running to an escarpment
directly on course.

4:29

Country more irregular,
broad valleys, a large very
dissected mt. mass. and
a low smooth cone. Then
some finely dissected land
about as thinly wooded pattern
very fine.

4:32

High abrupt volcano, wooded.

- 4:33 A river crossing course
- 4:35 A clump of volcanoes, wooded, one with a large breached crater with a village in it.
- 4:37 The last one in the clump is a fresh perfect cone with a sharp crater in the top, bare slopes $1/4$ to $1/2$ way down some forest below. This must have erupted recently.
- 4:38 A lake and sharp denuded mountains between it and course.
- Then the ocean - beach straight, at a very slight angle away from course, ending in a peninsula in direction of course, enclosing a bay with many islands. These mountainous, largely bare, but some bushy slopes.
- 4:40 A large volcano on a ~~peninsula~~ with a beautiful hooked spit pointing toward bay.
- 4:41 This volcano has a great sharp crater, apparently very fresh, with sharp rim, the outside bay and red, but only for a short distance down, sharp boundary with forest.

- 4:44 Head of bay enclosed by this peninsula is a maze of mangrove-lined tidal channels in an extensive low flat with about 3 rivers winding through it.
- 4:45 Bet. this and course wooded hills, some peaks bare.
- 4:46 The low flat extends well up the river, but uppermost reaches look like marsh, rather than low soil.
- Row of peaks along course look volcanic, but clouds obscure them somewhat. Upper slopes cut by ravines, partly bare.
- 4:47 Clump of small volcanoes, one of them bare and fresh, crater smoking a bit, very sharp. Others still have craters but a bit worn down, some bare or grassy slopes, some wood, on upper slopes, lower part wooded.
- 4:48 A tiny, perfect, dead black cone with a crater. Then several other somewhat larger cones with craters, rawny & partly wooded.
- 4:50 A number of these, and a larger one.

Mearaque

- 4:51 bare and red brown ~~at~~ in upper parts - quite fresh. Then complete cloud cover.
- 4:55 Crossed coast. sea is clear but land covered by clouds.
- 4:56 A peninsula, mostly bare but with a small bay with mangrove swamp.
- 5:00 Several small islands out from coast, high, mostly bare or grassy. Land in distance largely brown grass except for some wood or mangrove along shore. Visibility poor.
- 5:01 Coast in distance looks dry.
- 5:02 Small very irregular green island just to left of course. Coast coming closer, but haze rather thick. Some mangrove along coast, especially in bays and around ~~in~~ stream mouths.
- 5:04 Mostly forested land, but visibility very poor. Wooded from here on, becomes
- 5:09 ~~at~~ a bit hilly with a rather fine close pattern. More mountainous in distance. No evidence of shifting apr.
- 5:11 A large river winding off about 45° from course to left, splitting into

- 5:13 distributaries and entering sea through a vast delta. Clouds.
- 5:17 Crossed coast at a very small angle.
- 5:39 Crossed coast again, at about a 45° angle left of course. Getting too dark to see any details.

Jan. 22 - Left Panama 7:10 a.m.
arr. Seymour I. 10:15 a.m. (C 30)

Seymour I. - Low cliffs
near harbor.

Colletia sp. occasional on
rocks and talus. A green
almost leafless *holacanthus*
dense low diffusely branched shrub.
Also common a brown spiny
spiny leafless bush,
a *Ceanothus* (?), and a shrub
with fleshy alternate
leaves minute green fls
with prominent disk, in
axillary pulvini, a single
individual of what
appears to be a *Patropia*,
occasional arborescent *Opuntia*,
a few small *Perkinsia*
aculeata, much completely
dry grass. Lichens on
several of the shrubs.
Rock is a volcanic breccia.

Tidal flat backing
beach - silt with condensed
mud blown in on it.

Perkinsia aculeata scattered
Commicarpus ?

Sesuvium is *ortabaccharum*
The *Sesuvium* forming
small mats in wet silt. The
Commicarpus mats & low tangles

slightly higher up
the *Perkinsia* on sand
blown in, probably seldom
covered by tide.

Beach ridge across head
of bay.

Heliotropium curassavicum
holding hummocks of sand
near one end. *Coldenia* sp.
dead, also common.

In center of beach,
a ~~the~~ *Hippocris* bush.
The thick leaved *Celastraceae*
fairly common, also
Commicarpus and *Colletia*
near center of head of
bay, and extending
along boulder ridge toward
other side.

Beyond center is a remnant
of what looks like elevated
deep, perhaps 2 m. above L.T.
surface very pitted and
sharp. Much volcanic
rock included, so it
man will be difficult to break.
Very difficult to break.

The remnant is about
28 m long and
much eroded; gray color
(sample 1).

Another piece of obvious
beachrock, felled, dipping toward
the south (white line)

Curlew, golden plover?
Brown pelicans, frigate
minor, sea lions

Dozens of green turtles(?)
bask on sandy beach,
rocks.

Flight Seymour to Academy
Bay - Broad plain on Santa
Cruz covered by a somewhat
open forest of *Bursera*?
completely bare, branches
white. A few trees rather
inland are beginning to
turn green.

Another zone dominated
by *Psidium*, and one
dominated by *Leucaena*.

On the slope ~~of~~ above
Academy Bay several
clearings and dwellings.

Opuntia in all the types
except the *Bursera* zone.

Around Academy Bay
Village *Cyrtocarpus* is
dominant shrub.

Academy Bay

Exotic plants

Baccharis tomentosa

Ficus carica

Carica papaya

Catharanthus rosea

Passiflora foetida var. *hispida*

Annona cherimolia

Phoenix dactylifera

Nerium indicum

Terminalia catappa

Bougainvillea spectabilis

Albizia sp. of vera

Cynodon dactylon

Pereskia

Gibberia hybrid

Canavalia hybrid

Portulaca grandiflora

Mesembryanthemum

Solanum lycopersicum

Pelargonium zonale

Agave

Sonchus

Annarathus

Vitis vinifera

Rhoeo spathacea

Datura (*Brugmansia*) sp.

Plantago

Momordica charantia

Buellia cf. *longifolia*

Cucumis melo

Caesalpinia pulcherrima

Yucca sp.

Jan. 22 - Seymour Island

- ~~along~~ around bay where
sea plane ramp is located
44674 *Maytenus octogona* (L'Her.) DC. det. D.M. Porter 11/12/69
Maytenus obovatus
common on beach ridge
5 75 *Maytenus obovatus* Hook. f.
~~common on~~ occasional on
low tectic cliff.
5 76 (lichen)
on twigs of bare bush
77 ~~lichen on twigs of bare bush~~
5 77 (lichen)
on twigs of bare bush
78 ~~Caesalpinia~~
5 78 *Parkinsonia aculeata* L.
common on flat just
above high tide
5 79 *Sesuvium portulacastrum* L.
(very local on tidal mud flat)
Sesuvium Edmonstonei Hook. f. Det. D.M. Porter, 1975.
5 80 *Cryptocarpus pygmaeus* HBK.
abundant locally,
on tidal flats (also seen
on higher rocky ground
and on sand)

1.5 m.



shrub 3 m. tall, densely
branched; flowers green
irregularly branched
bush, leaves stiff,
fleshy, brittle; flowers green.

shrub 3 m. tall, widely
spreading, flowers
yellow.
forming dense mats,
stems green, leaves fleshy,
dull, not strongly
compressed, erect,
flowers pink.
- sprawling fleshy shrub,
flowers greenish.

Jan 23 - Academy Bay
~~low~~ Tangled scrub of
 Cryptocarpus and many
 other shrubs, with
 scattered tall Opuntia
 on flat ground back
 of high tide line.

When the ground
 begins to slope up
 there is immediately
 replaced by a taller
 scrub, 3-5 m. tall, of
 Croton, ~~Opuntia~~,
 Acacia, Cryptocarpus,
 Cereus, Colletia, ~~Castel~~, May ~~leaves~~

Little undergrowth and
 almost no herbs. There
 is on bare lava, very
 little soil even in pockets.
 Boerhaavia, Portulaca are
 occasional.

Cordia, Lantana and Valleria(?)
 are occasional.

The Croton is just starting
 to put forth new leaves.

On rather lower lava
 near the fault scarp
 Cryptocarpus seems
 dominant, with few
 deciduous species. But
 the scrub is definitely
 open with the black
 lava showing between

the trees when looked at
 from the top of the scarp.
 Cereus is more abundant
 here than Opuntia, but
 the latter is still common.
 3 photos (see) from cliff top.

Precipice of lava
 dominated by
 Cryptocarpus, but
 with Croton, Bursera,
 Opuntia, Prosopis, Castel's

Polypodium and Pityrogramma
 rare in crevices.

Lichens abundant
 on rocks and ~~in~~ on rocks
~~from~~

On top is a lava flat
 with some red soil in
 pockets. This is covered
 by a scrub about 3 m. tall

of *C. alba*, just leafing out, with scattered *Opuntia* to 1 m. and *Bursera* to 5 m. just leafing out. Some *Passiflora* & *Maytenus*. The *C. alba* is sparse. 1-2 m. and plants stone to 1 m. down.

Locally *Psidium* & *Cordia* & *Desmodium* in place. Patches of an intricate shrub (*Melastoma*? *Acacia*).

Also goat-torn dwarf shrubs of a aromatic *Lantana* type esp. in open places.

A seedling *Ipomoea* & seedling *Legumin* (phaseolid) and *Evolveria* common on ground, esp. in crevices & much dead wood.

Farther on where ground slopes up again, *Bursera* is dominant. Deciduous scrub forest about 7 m. tall with liberal component of *Opuntia* and some *Cereus* the same height. Much dead wood.

Jan. 24 - Academy Bay

Lowland scrub - dominated by *Cryptocarpus* which forms tangles up to 3+ m. deep. The clumps are from 1 to 3 m. apart, many stems and branches, these to 5 or more m. long, forming a continuous tangle. Mixed with this are scattered tree *Opuntia*, large shrubs of *Maytenus*, occasional bushes of *Colletia*, *Castela* (spineless), *Froelichia*, *Alternanthera*, and very commonly, tall tree-like shrubs of *Croton scouleri*, these 3-4 m. tall, irregularly distributed.

Locally there are groves of *Opuntia*, and just back of the mangrove, groves of *Hippomane*.

The *Cryptocarpus* tends to climb over the *Hippomane* and form large mounds.

Jan. 23 Academy Bay
vicinity of Geomorphological Station
in open scrub forest
on basaltic lava ^{rock}
44681 *Vallesia glabra* (Cav.) Link. (det. Andersen 1978)
5 occasional in very
sparse undergrowth
on lowest slope, below
escarpment

5 82 *Prosopis dulcis* Kunth
(occasional on cliff
P. juliflora (Sw.) DC.

5 83 *Castela glauca* Hook. f.
~~rare~~ rare on cliff.

5 84 *Polypodium tridens* Kunze det. Porter 1974
rare in crevices on cliff.

5 85 *Commelina diffusa* Burm. f.
occasional on upper
ledges of cliff.

1 86 *Boerhaavia scandens* L.
occasional on ledges of cliff

1 87 *Roevela*
local under overhanging
rocks on cliff.

5 88 *Bursera graveolens* (HBK.) Tr. & Planch. det
occasional on cliff

1 89 *Malpighia*?
local
occasional in open scrub

1 90 *Lantana*?
common in more open areas

10-20 m.

elongate, semi-scandent
lactiferous shrub. corolla limb white,
ripe fruit white, fleshy

spreading, diffuse
shrubs, flowers dull
cream, pods immature,
det. Porter ~~semi-scandent~~
small tree with arching
semi-scandent elongate
branches.

rhizome prostrate,
much branched, stipe thick,
yellow when broken.
det. Porter prostrate, ~~st~~

D. M. Porter
1970

small tree, scarcely
leafed out, fruit immature,
sterile, intricately branched
shrub, herbage with a
slightly shunby odor when broken.
aromatic, sterile, shrub
eaten down by goats.

44691 *Croton scouleri* Hook. f. var. *scouleri*
~~in~~ det. D.M. Porter 1974

1 92 *Cordia lutea* Lam.

occasional in inner

5 93 *Evolvulus* ~~in more open part of terrace~~
 common locally in
 crevices and pockets of
 soil

5 94 *Croton Evolvulus glaber* Spreng. (Det.
 D.M. Porter) common on inner
 part of terrace

5 95 *Acacia macracantha* H. and B. ex ^{ind.}
 common in inner
 part of terrace in more open areas

6 96 *Boerhavia scandens* L.
 common generally
 in crevices and pockets
 of soil

2 97 *Boerhavia caribaea* Jacq. det. D.M. Porter 1975.
 rare in pockets of soil

1 98 *Desmodium* ^{Procumbens (Mill.) Hitchc.}
 var. *Procumbens*
 occasional in pockets of
 soil, in clearing.

5 99 *Portulaca oleracea* L.
 common in clearing
 rare in pockets of
 soil in scrub

shrub 1.5 m. tall.

prostrate

D.M. Porter) shrub 3 m. tall.

44694: *Croton scouleri* Hook. f. var. *scouleri*
 det. D.M. Porter 1974

flat-topped tree 4 m.
 tall, flowers orange.

young shoots from
 heavy rootstocks,
 flowers pinkish.

prostrate, leaves
 somewhat in one plane,
 fleshy.

Jan. 24 Academy Bay
in lowland scrub

just back of mangrove zone.

1-2 m.

44700 *Tournefortia pubescens* Hook. f. (Det. P. M. Porter)
very local

5 01 *Heliotropium curassavicum* L.
locally common in
openings

12 Det. P. M. Porter 1975 02 ~~*Tournefortia*~~ *Alternanthera filifolia* (Hook. Kf.) Howell
common in openings

0 m.

- same - in edge of
mangroves

5 03 *Avicennia germinans* (L.)!
rare det. Moldenke

5 04 ~~same - in scrub on lava rock~~
Maytenus octogona (L. Her.) DC. det. D. M. Porter 10/12/69
Maytenus ovata Hook. f.
occasional

5 Det. P. M. Porter 1975 05 *Cryptocarpus pyramidalis* HBK.
abundant, dominant

5 06 *Acacia imulata-jacobi* Rides
rare, on lava ridge

5 07 *Colletia acutia pauciflora* (Hook. f.) Weberl.
common

5 08 *Alternanthera echinocephala*
common

5 09 *Tournefortia pilostachya* HBK (Det. P. M. Porter)
rare

shrub to 2 m. tall,
flowers white, fruit white, fleshy.
very glaucous; flowers
white, eye greenish yellow.

much branched, green-
stemmed, suffrutescent,
up to almost 1 m. tall.

small tree, 4 m. tall,
leaves somewhat glaucous
beneath.

1-3 m.

shrub 3 m. tall, leaves
thick, flowers green.

brittle, fleshy scandent
shrub, forming tangles.

shrub 2-3 m. tall spreading,
flowers deep orange yellow
fragrant

det. Porter

low rigidly and intricately
branched shrub, flowers yellow-green
suffrutescent herb 2 m. tall
heads dull white.

shrub to 2 m. tall
with drooping elongate
branches white flowers.

Jan. 24 - Academy Bay
mangrove zone.

Flora

Rhizophora mangle L.
Avicennia officinalis L.
Laguncularia racemosa (L.) Gaertn.
Conocarpus erectus L.
Spartina
Sesuvium portulacastrum L.
Sporobolus virginicus
 (L.) Kunth

The

The mangroves here grow on bare basalt rock where it slopes or forms terraces covered at high tide. Silt and sand accumulate around their roots wherever there is rock debris to hold the mud. Along much of the shore in front of the mangroves are accumulations of broken rock with sand and silt covered. Back of the crest, by *Sesuvium* and *Sporobolus virginicus*. The seaward slopes of these boulder ridges are

inhabited by marine iguanas.

The mangrove fringe is generally quite narrow, locally *Laguncularia*, locally *Avicennia* dominant, with some admixture of *Rhizophora*.

Jan. 24 - back of Academy
Bay, beginning of
trail to ^{Belmonte} Horneman farm.

Open mixed scrub
openness probably result
of clearing - cut trees
and stumps present -
Discaria, Cryptocarpus,
Valleria, Acacia 2 spp. ^{Zanthoxylum} un
Cordia lutea, Cordia sp.
Castela Tournepatia, ^{Q.} with
scattered trees - Pisonia,
Bursera, Piscidia, Acacia,
Opuntia, Parkinsonia (s.)

Where this has not
been cleared it is an
irregular - open to closed
scrub ~~thick~~ forest, with
the same composition
but also with Maytenus

In the cleared area,
in crevices and pockets
of soil Brehavia hirsuta,
B. scandens, Trianthema
setaria, Passiflora
foetida, Portulaca oleracea,
Ipomoea sp., Galactia?
Abutilon sp. are all common.

Cryptocarpus is spreading
very thin, thinly now.

Jan. 24 - Academy Bay
lower part of trail to ~~El Estero~~ ^{Bella Vista}
in xerophytic scrub on
bare lava rock

44710 *Cleodendrum molle* HBK.

1 rare

1 11 *Boerhavia scandens* L.
common

1 12 *Capraia biflora* L.
occasional along trail.

1 13 *Sida spirosa* (det H. Andersen 1978)
occasional along trail

5 14 *Heliotropium angiospermum* Murr. (Det. D.M. Porter)
rare, not far from shore

5 15 (grass) *Setaria setosa* (Sw.) Beauv. det. D.M. Porter 1974
occasional in open areas

3 16 *Plumbago scandens* L. (det H. Andersen 1978)
occasional in open places

2 17 (legum) *Galactia velutina* Benth.
occasional in open places

1 18 *Ipomoea*
rare in open places

5 19 *Trianthema portulacastrum* L.
common in open places
in pockets of soil.

5 20 *Passiflora foetida* L. var. *galapagensis*
common in disturbed places

5 21 *Abutilon depauperatum* (Hook. f.) Anders. ex Rob. (Det. P.M. Porter)
common in open places

8 22 *Pisonia floribunda* Hook. f.
one tree seen

5 23 *Cordia*
rare

10 - 20 m.

scandent shrub; sterile.

elongate herb, leaves
green beneath

dwarf shrub.

erect tufts

flowers white.

twining over bushes

flowers rose purple, closing
in late afternoon.
leaves thin, fleshy.

prostrate and climbing
stems from central root
crown.

flowers pale
narrow, separated.

Tree with strongly ascending
branches, fruit from ground.

58 1964 Galapagos I.

- 44724 *Acacia macracantha* H. and B. Willd.
common
- 2 25 *Valleria glabra* (Cav.) Lint. (det. Andersen 1978)
common
- 1 26 *Turnefortia pubescens* Hook. f. (Det. D.M. Porter)
occasional
- 1 27 *Acacia insuavis-jacobi* Ridley
common
- 1 28 *Tamarindus*? *Prosopis juliflora* (Sw.) DC.
rare, near dwelling
- 1 29 (legum) *Piscidia carthagenensis* Jacq.
common
- 2 30 *Chioscoa alba* (L.) Hitchc.
occasional
- 1 31 *Valleria glabra* (Cav.) Lint. (det. Andersen 1978)
common
- 5 32 *Poerhavia caribaea* Jacq. Det. D.M. Porter, 1925
very common on bare lava rock, especially in open places.
- 8 33 *Cordia lutea* Lam.
common
- 1 34 *Cryptocarpus*
abundant

Jan. 25 - Academy Bay
on muddy flat just back
of rocky shore, wet by
sea water at high tide

- 6 35 *Sporobolus virginicus* (L.) Kunth
abundant

Indefatigable (Santa Cruz) 59?

- small spreading
- flat-topped tree; flowers orange.
shrub 2 m. long, spreading,
lactiferous; flowers white.
- shrub 2 m. tall;
flowers white.
shrub 2.5 m. tall.
- small tree 3 m. tall, nearly
flat topped.
- shrub 2 m. tall (others
seen tree size); sterile.
- shrub 2 m. tall.
- weak shrub; flowers white.
- branched from base,
branches ascending,
branched in one plane.
shrub 3 m. tall,
corolla bright yellow,
ripe fruit white, fleshy.
- specimen to show
rooting of prostrate stems.

forming a thick sod.

Jan. 25 - Trail to Horneman
Farm from Academy Bay,
near ~~La Cumbre~~ ^{Point of View} ~~Shack~~

Open & closed scrub
forest on lava - much
Opuntia (photos bot. 1 & 2)

This seems to be about
the beginning of the
"cursera forest". It would
be an open scrub forest
about 2 m. tall, mixed
Cursera and Opuntia with
a denser tall scrub
layer of Zanthoxylon,
Croton, Opuntia, Elettaria,
etc. All the other *eschweilera*
and a *gouania* layer
of Abutilon, Cypripedium,
Ipomoea spp., Pteleocarya,
Ficus, etc. *eschweilera*
franchetii, *eschweilera*,
Alternanthera, *eschweilera*,
etc.

Beyond the ~~Point of View~~
the forest becomes a bit
denser. (Photos bot. 3 & 4)

One Opuntia about 2 m. tall
measured, d.b.h. 18 cm girth, 1.6 m.
Acacia common. Shrub
layer not so prominent
tree layer more irregular
denser.

Above precipice called
La Cumbre the forest
becomes closed and
taller up to 12-14 m.

Still some Opuntia.
Usnea draped over
some trees.

(photo - bot. 5)

From top of precipice to
Hornemann place (at 600')
the vegetation gradually
assumes a more and
more mesophytic aspect,
becomes denser, less
species are deciduous,
composition becomes richer,
Pisonia becomes abundant,
Opuntia disappears.

Around Bella Vista
the vegetation is degraded
and disturbed, mostly
a tangled secondary
scrub.

Jan. 25 - trail from Academy
Bay to Bella Vista (La Fortuna)
near first large fault crack
in open scrub-forest,
~~on~~ in pockets of soil
and crevices in lava rock

44736

Ipomoea

occasional

1

37

Heliotropium angiospermum Murr. (Det. D.M. Porter)

occasional

1

38

Fleurya aestuans Gand.

rare in crevices

5

39

Ipomoea

common

1

40

Mentzelia aspera L.

rare in crevices

#

same between the two
faults.

in open scrub forest on
lava rock.

5

41

Acacia xerodermia Christoph.

occasional

5

42

Malvastrum coromandelianum

common locally in pockets of soil.

1

43

Chiococca alba (L.) Hitchc.~~shrub 1.5 m. tall~~

3

44

Croton scouleri Hook. f. var. *scouleri*~~shrub 1.5 m. tall~~ common

2

45

Amaranthus

occasional in pockets of soil

1

46

Scutia pauciflora (Hook. f.) Weberb.

common

25 m



creeping, flowers pink.

flowers white, with
yellowish eye.

creeping, flowers white.

40-50 m

small spreading tree
4 m. tall, flowers orange,
fragrant.

shrub 1.5 m. tall.

shrub 1.5 m. tall

Det. D.M. Porter 1974

shrub 0.7 m. tall, stems
green, stiff.

- 44747 *Sida spinosa* L.
occasional
- 5 48 *Panicum fasciculatum* Sw. det. D.M. Porter - 1974
common
- 2 49 *Boerhaavia caribaea* Jacq. det. D.M. Porter - 1975
common
- 5 50 *Euphorbia* *Chamaesyce ophthalmica* (Pers.) Burch (det. H. Andersen 1978)
common locally
- 1 51 *Chrysocoma alba* (L.) Hitchc.
occasional
- 1 52 *Heliotropium angiospermum* Murr. (det. D.M. Porter)
common
- 5 53 *Heliotropium angiospermum* Murr. (det. D.M. Porter)
~~is~~ rare variant
- 5 54 *Plumbago scandens* L.
occasional, in full sun.
- 1 55 *Cyperus*
rare, in crevices in lava
- 2 55a *Cenchrus platyacanthus* Anders. det. D.M. Porter 1974
occasional
same - near foot of precipice
- 5 56 *Tournefortia pubescens* Hook. f. (det. H. Andersen 1978)
rare
- 5 57 *Tribulus cistoides* L.
rare, in full sun
- 3 58 *Capraia biflora* L.
common in trail
- 1 59 *Justicia*
rare
- 5 60 *Tournefortia pubescens* Hook. f. (det. D.M. Porter)
occasional

spreading tufts

spreading to prostrate,
flowers deep rose.

erect shrub 1.5 m. tall,
buds white.

flowers white,
eye yellowish.

~~fls~~ loosely branching
branches ascending,
flowers white.

plant prostrate with
ascending branches,
deep purple; petals white,
rather narrow.

spreading culms.

culms ascending to erect.

shrub 1.5 m. tall,
flowers white.

prostrate, stems

radialing from root crown.
flowers white.

shrub 2 m. tall;
flowers white.

44761 *Tournefortia rufo-sericea* Hook. f. (Det. D.M. Porter)
5 occasional

5-10 ^{Det. Porter, 1975} 62 *Alternanthera halimifolia* (Lam.) Standl.
rare at this altitude

10 63 *Alternanthera filifolia* (Hook. f.) Howell.
locally common

Jan. 26 - trail between
Bella Vista and abandoned
village of Lince Enrique
disturbed mossy forest

600'

700 m.

H. d. West II.

5 64 *Asplenium* f. det. Kuntze ex F. det. H. d. West II.
epiphytic

1 65 *Conyza canadensis*
in weedy clearing

3 66 *Lonchocarpus*
in weedy

2 67 *Nephrolepis cordifolia* (L.) Presl det. Porter 1974
on fallen log

5 68 (comp.) *Adenostemma laevicaule* (L.) Kuntze
occasional along trail

5 69 *Psychotria infipera* Hook. f.
abundant in undergrowth

det. Porter

1 70 *Flourensia aetnensis* Gand.
common along trail

3 71 *Urera caracasana* (Jacq.) Griseb. (det. Andersen 1978)
rare in undergrowth

2 72 *Cordia*
rare in undergrowth

2 73 *Cordia*?
rare (to 1174)

shrub 1.5 m. tall,
flowers white; ripe
fruit white, fleshy.
- plant spreading,
depressed.
- much branched.

flowers yellow.

large much branched
herb with thick stem, 0.7 m. tall
flowers white

- shrub with green stem,
1.5 m. tall, fruit red, fleshy
flowers white

- stinging herb, stems
reddish.

- shrub 2 m. tall, sparsely
branched, inflorescences
on bare stems below leaves

- shrub 2.7 m. tall

- tree 4 m. tall, gnarled.

Jan. 26 - trail between
^{Carrizal}
^{La Cooperativa} ~~La Bella Vista~~ Bella Vista and
 Ponce Enriquez (abandoned
 colony).

The general vegetation
 is a degraded *Scalesia*
 forest, quite open, the crown
 touching only in places.
 Some areas have a strong
 admixture of *Psidium*
galapagense and *Zantho-*
oxylum fagara, or only
 the latter, in places
 dominant, with either
 few or no *Scalesia*. The
 trees are 10 m. or more tall,
 especially the *Scalesia*.
 The *Scalesia* have
 straight bare trunks
 and an umbrella-shaped
 crown, fully leafy. The
Zanthoxylum and the
Psidium are gnarled,
 diffusely branched and
 spreading, sparsely
 leafed, and covered by
 festoons of a hanging
 dark brown moss. (Here
 and there are cleared places.

The whole has a deep
 layer of herbaceous
 or subshrubby undergrowth,
 this thick and about 2 m. or
 more tall.

The ground is a dark
 soil, deep in pockets,
 rock showing through
 in others. ~~the~~

This vegetation seems
 to have suffered from
 the degradations of
 log cutters, wild cattle,
 wild hogs, donkeys etc.

Apparently this herbaceous
 undergrowth appears
 very rapidly in the
 wet season, and
 lies to the ground in
 the dry season (except
 probably the abundant
Psychotria).

~~Jan. 26~~
 Jan. 26 - trail between
 Ponce Enriquez and
 "Table Mountain" (Los
 Negritos).

This runs through
 less disturbed forest,
 partly an extremely
 mossy *Psidium*-
Zanthoxylum open
 gnarled forest with
 a deep herbaceous
 + sub-shrubby under-
 growth. The trees are
 spreading and not
 very leafy, spaced

up to the ~~length~~ width of the crowns, in places the crowns touching.

Parts of this trail are through areas of *Scaevola* forest varying from open to closed. The trees tall, bare to the umbrella-shaped crowns, which are light green.

Areas where the *Scaevola* has been cut or destroyed in some way are producing thick crops of *Scaevola* saplings.

The *Xanthoxylum* and *Psidium* are swathed in masses of hanging moss, yellow-green to dark brown. The undergrowth is from 2 to 3 m. deep. *Psychotria* is very common. The rest is of fast growing herbs. (photos)

Near the grass-topped hill called Table Mountain are rather extensive open meadows, with intricate series of low rolling hummocks with shallow pools of water between them - the

hills and depressions covering about half and half of the ~~area~~ open areas. The grass seems to be largely *Stenotaphrum secundatum* or some similar wide-leaved stiff low grass, some *Paspalum conjugatum*, and abundant sedges - *Eleocharis*, *Dichromena*, *Cyperus*, etc., also abundant *Alternanthera* (reddish, pubescent), and *Cuphea carthagenensis*. The water is mostly covered by a thick layer of bright red *Azolla*.

This is the "Tortoise Country" of Swenson. Several large tortoises were seen, grazing on the grass and herbs. (photos)

It is surrounded on the side away from the hill by *Scaevola* forest (photos) and on the side toward the hill by a scrub of *Erigeron* sp.?, forest of *Croton* sp. which extends up the hill, and *Scaevola* forest. Top of hill is grassy. (photos)

The "Tortoise country" is rather extensive and usually in long, rolling openings, with *Scaevola* forest and *Psidium* between them. This combination extends north or northwest to a tremendous collapse crater several hundred yards across and 400-600 ft deep. Upper walls are vertical talus below. A grassy spot occupies the center of the bottom, and thin forest the talus and such parts of the side as are not quite vertical. (photos).

Bella Vista -
exotic plants

Ochroma pyramidale
Panicum maximum
Cymbopogon nardus
Colosasia esculenta
Manihot ~~altissima~~ esculenta
Xanthosoma sagittifolius
Jatropha curcas
Cordia variegata
Fambusia mexicana
Pisonia communis
Solanum tuberosum
Saccharum officinarum
Pe. rubra
Gymnocallis littoralis
Ipomoea batatas
Eclipta alba
Adiantum fraxinaceum
Psidium guajava
Eleusine indica
Mangifera indica
Inga sp.

74

1964 Galapagos Is.

(ctd. from p. 66)

- 44774 *Solanum nigrum* L.
common in ~~at least~~ clearing
- 3 75 *Asplenium acutum* var. *auriculatum*
epiphytic
- 1 76 *Polypodium steirolepis* C. Chr. det. Porter
epiphytic
- 3 77 *Pleuropetalum derwinii* Hook. f. det. H. v.d.
occasional along trail
- 6 78 *Galium galapagoensis* Wigg.
very local, one tangled
colony in old clearing

Jan. 26 - Trail between Once
Enrique (abandoned village) and
"Table Mountain" (Los Negritos)
"Tortoise Country".

in ~~at~~ rather degraded
mossy ~~forest~~

- 2 79 (fern) *Dennstaedtia globulifera* (Poir.) Hieron
occasional
- 1 80 *Nephrolepis cordifolia* (L.) Presl det. Porter
epiphytic
- 2 81 *Spermacoce suffrutescens* Jacq. (det. H. Andersen 1978)
abundant in herbaceous
undergrowth
- 5 83 *Phoradendron*
common, parasitic on
Zanthoxylum fagara (L.) Sarg.
- 2 84 (solan.)
rare
- 2 85 *Solanum nigrum* L.
common ~~in~~ along trail
- 2 86 *Spermacoce suffrutescens* Jacq. (det. H. Andersen 1978)
common in trail

Indefatigable

75

much-branched sprawling
herb, flowers white.

(Hook. f.)
Morton & Lelinger det. Porter

1974

Werff.

det. Porter

shrub 1 m. tall; inflorescence
red, calyx orange.
tangled mass, sterile;
(could have come from RioBamba
with colonists).

200 -

260 m

det. Porter

1974

fronds almost erect, 2 m.
tall, from erect rhizome.

stems red, flowers
white.

stems erect, 1 m. tall, several
from base; fruit white,
translucent.

shrub 1 m. tall, buds
white. fruit immature.
much branched herb,
flowers white.

with # 44781, but corolla half as
large, stems green, flowers white.

- 44787 *Polypodium lanceolatum* L. det. Porter 1974
epiphytic
- 5 88 *Solanum nigrum* L.
rare along trail in opening
- 6 89 ~~*Polypodium*~~ *Mecardonia dianthera* (Sw.) Pennell
abundant along trail
- 5 90 *Chiococca alba* (L.) Hitchc.
rare
- 3 91 *Epidendrum spicatum* Hook. f.
~~common~~ rare, epiphytic
- 5 92 *Jaegeria crassa* Torres det. Porter
abundant along trail
- 1 93 *Asplenium cristatum* Lam. det.
terrestrial
- 4 94 *Pilea baurii* Robins (det. H. Andersen) 1978
common
- 2 95 *Psychotria rufipes* Hook. f.
abundant in undergrowth
- 4 96 *Doryopteris pedata* var. *palmata* (Willd.)
common, terrestrial
- 5 97 *Psychotria rufipes* Hook. f.
abundant in undergrowth
- 5 98 *Psychotria rufipes* Hook. f.
abundant in undergrowth

Jan. 26 - "Tortoise Country"
near hill called "Table Mountain"
or "Los Negritos"
in ~~an~~ open meadows
with wet depressions

- fronds leathery
- much-branched compact
bushy herb, m. tall
flowers white.
- det. Porter - prostrate, flowers yellow.
said to have been recently
introduced but to have
spread very rapidly.
- det. Porter - shrub or small tree 4 m
tall, branches elongate,
subscandent.
flowers yellowish,
mostly seen fruiting
flowers yellow.
- Porter - stems thick, translucent,
juicy, edible.
shrub 1.5 m tall, flowers
white.
- Hicken det. Porter 1974
- shrub 2 m. tall, flowers
white, fruit red, fleshy.
shrub 1.5 m. tall, flowers
white, fruit immature.

275 m.

- 44799 *Dichromena* *Rhynchospora nervosa* subsp. *ciliata*
 5 common (M. Vahl) T. Koyama det. D. M. Porter 1974
- 3 800 *Ageratum conyzoides* L.
 abundant
- 2 01 *Spilanthus acmella* (L.) Murr.
 occasional
 in edges of wood
- 5 02 (malv.) *Anoda xacavifolia* DC. (Det. D. M. Porter)
 common
- 5 03 (cucurb.) *Elaterium carthaginense* Jacq.
 common in edges of woods
- 2 04 *Phoradendron henrici*
 parasitic on *Croton* sp.
- 2 05 *Croton scouleri* var. *grandifolius* Muell. Arg.
 common around meadow,
 abundant on hill above.
- 2 06 *Cuphea carthaginensis* (Jacq.) Macbr.
 abundant locally
- 2 07 *Erigeron* ?
 dominant in scrub around
 meadow
- 3 08 *Spermacoce*
 common, growing in scrub
 around meadow
- 1 09 *Ligna luteola* (Jacq.) Benth.
 common
- 2 10 *Cassia sophera* (L.) Roxb. det. Barnaby 84
 abundant locally
- 1 11 *Cyperus rivularis* ssp. *lagunetto* (Steud.) T. Koy.
 common in wet places
- 1 12 *Cyperus brevifolius*
 common in wet places
- 2 13 *Eleocharis nodulosa* (Roth) Schult. det. D. M. Porter 1974
 abundant in wet places

- tufted; bracts white.
- aromatic herb, flowers
 - purple.
 disk white.
- tangled herb,
 flowers white
- det. H. v. d. Werff
 Tangled; flowers yellow-
 green; fruit immature.
- det Porter 1974
 tree 5 m. tall, aromatic
 when broken.
- det D. M. Porter
 Dec. 1969
 plant reddish, flowers
 magenta.
- shrub 1 m. tall,
 compactly branched; sterile.
- stems reddish; flowers
 white.
- creeping and twining
 in grass, flowers yellow,
 keel not twisted.
- shrub to 0.5 m. tall;
 flowers orange-yellow.
- det. Koyama 1974
- heads green.
- tufted

- 44814 *Azolla microphylla* Kauts. det. Porter 1974
 5 abundant on ^{small} ponds, floating
 1 15 *Digitalis horizontalis* Willd. det. D.M. Porter 1974
 common
 1 16 *Oxalis corniculata* L.
 common
 4 17 *Drymaris cordata* (L.) Willd.
 very common
 1 18 *Lobelia xalapensis* HBK. (det. Andersen 1978)
 occasional
 2 19 *Elephantopus spicata*
 occasional
 1 20 *Datura stramonium*
 rare
 5 21 *Acalypha*
 common locally
 5 22 *Alternanthera halimifolia* (Lam.) Standl.
 abundant generally 1975.
 1 23 *Solanum nigrum* L.
 common
 2 23a (morph.) *Leptocarpus verticillatus* (Mill.) Thrauger
 common locally
 Jan. 24 - near large crater
 about 1 km n.w. of Pabla Mt.
 (Los Negritos).
 in mossy forest
 2 24 *Tournefortia rufo-sericea* Hook. f. (det. D.M. Porter)
 occasional
 2 25 *Peperomia galapagensis* Hook. f. (det. H. Andersen 1978)
 abundant, epiphytic
 26 (morph.)
 common to
 1 26 *Plantago* ^(?) *Plumbago major* L. (det. H. Andersen 1978)
 occasional in open place
 2 27 *Asplenium auritum* var. *auriculatum*
 epiphytic

- plants bright red
 in mass.
 erect, from creeping rootstock,
 flower yellow.
 pedicels fleshy, sticky,
 caducous.
 flowers pale lavender.
 flow pale purplish white.
 prostrate, reddish.
 plant diffuse, reddish.
 extensively branching
 herb, flowers white.
 flowers purple.
 275 m.
 shrub 3 m. tall;
 flowers white.
 erect, fleshy.

- 44328 *Phoradendron henslowii* (Hook. f.)^{Rob.}
 1 parasitic on *Scaevola*
 1 29 *Fleurya asstrans* Gaud.
 common
 3 30 *Croton scouleri* var. *grandifolius* Muell.-Arg. det.
 occasional
 5 31 *Croton scouleri* var. *grandifolius* Muell.-Arg. det. Porter
 occasional
 1 32 *Psychotria rufipes* Hook. f.
 common
 2 33 *Bidens*
 occasional in opening
 5 34 *Parmelia*
 on rotting fallen branch
 2 35 *Asplenium praemorsum* Sw. det. Porter
 on edge of crater
 2 36 *Polypodium dispersum* A.M. Evans det. Porter 1974
 abundant terrestrial
 in crevices ~~in~~ at edge
 of crater.
 2 37 *Asplenium auritum* var. *auriculatum* (Hook. f.)
 epiphytic
 5 38 *Polypodium tridens* Kunze det. Porter 1974
 epiphytic

Jan. 27 - Bella Vista
 in Horneman Garden

- 1 39 *Datura*
 planted and very persistent
 3 40 *Polypodium insularum* (Morton) de la Sota det. Porter 1974
 (with
 S. Horneman) epiphytic in avocado tree
 1 41 *Nerine*?
 planted

little.

stinging herb

Porter 1974 small tree

1974 small tree

shrub 1 m. tall;
 — fruit red, fleshy
 flowers yellow.

Porter

Porter 1974

(Hook. f.) Morton & Lellinger det. Porter

200 m.

tree 5-6 m. tall, flowers
 pendent, salmon pink.

det. Porter 1974

acaulescent, flowers white.
 6 stamens

- 44842 (grass) *Eleusine indica* (L.) Gaertn.
in trampled path
1 43 *Sida rhombifolia* L.
abundant

- 1 44 *Verbena littoralis* HBK.
common weed

43

Jan. 27 Bella Vista

around cleared ground

- 2 45 *Sicyocaulis pentagonus* Wiggins det. v.d. Werff

~~in~~ climbing in fence row

- 1 46 *Senna pistaciifolia* var. *picta* (L. Don) Irving
~~Cassia~~ & Barneby det. Barneby 84
in fence row

- 2 47 (solan)
occasional by paths

- 1 48 *Carbaleum conjugatum* Berg.
~~*Eleusine indica* (L.) Gaertn.~~
occasional by paths

- 2 49 (lichen)
on fallen balsa trunks

- 2 50 (lichen)
on fallen balsa trunks

- 3 51 *Amaranthus quitensis* HBK det. D. M. Porter, 1975
rare in roadside canals

- 3 52 *Stictocardia tiliaefolia* (Desr.) Hall. f. det. v.d. Werff
common in thickets

- 2 53 *Bidens*
occasional on roadside

- 5 54 *Trema micrantha* (L.) Bl. (det. H. Andersen 1978)

~~common~~ common locally along road.

- 2 55 *Bambusa vulgaris* Schrad. ex Wendl. det. Tom Soderstrom, 1975
rare, planted

spreading prostrate culms

tall herb, about 1 m, flowers
dull orange with maroon
center.

flowers purple.

200 m.

elongate herbaceous vine;
flowers white.

shrub 2 m. tall.

buds yellow.

flowers deep purple
with pair of small
yellow spots on palate.

herb 1.5 m. tall, stems red.

erect herb 1 m. tall,
flowers yellow.

tree 8-10 m. tall.

large clumps, culms
dark green.

Jan. 27 "New Road" ~~to~~
near Bella Vista
along cleared roadway

- 44856 *Eclipta alba*
common in weedy vegetation
- 1 57 *Desmodium canum* (Gineb) Schinz +
occasional The Lung
- 2 58 *Salvia occidentalis* Sw. (det. Andersen 1978)
occasional
- 2 59 *Desmodium Jimense* Hook.
common
- 2 60 *Desmodium canum* (Gineb) Schinz
occasional + The Lung
- 1 61 *Coryza canadensis*
rare
- 3 62 *Prinos / lappulaceae f. albiflorum* ~~det. M. L. ...~~ flowers white.
local
- 2 63 *Momordica charantia* L.
abundant
- 4 64 *Justicia galapagana* Lindl.
common
- 2 65 *Rhynchosia minima* (L.) D.C.
common
- 1 66 *Chiococca alba* (L.) Hitchc.
occasional in thicket
- 1 67 *Strocardia tiliifolia* (Desf.) Hall. f. det.
common

Jan. 27 "New Road,"
somewhat below Bella Vista
in roadside thickets

- 68 *Acalypha*
occasional

200 m.

erect; rays white.

erect, leaves glaucous
beneath.

flowers bluish white.

stems elongate,
sparsely branched,
flowers cream white.
erect.

flowers white.

extensive vine;
flowers yellow.
flowers magenta-pink.

herbaceous vine,
flowers yellow.
scandent shrub,
fruit white, fleshy.

extensive vine,
corolla rose-purple.

150-175 m.

shrub 1.5 m. tall

44869 *Capsicum frutescens* L.
occasional

4 70 *Clerodendrum molle* HBK. ^{var. glabrescens det. H. Andersen}
occasional

2 71 *Galactia veddwiana* Benth.
occasional

4 72 *Croton scouleri* var. *grandifolius* Muell.-Arg.
det. Porter 1974

2 73 *Malvastrum coromandelianum*
common

4 74 *Sida hederifolia* Cav. (det. O. M. Porter)
locally abundant

1 75 *Chiococca alba* (L.) Hitchc.
occasional

1 76 *Cleome indisa* Gaertn.
occasional in road

1 77 *Croton scouleri* var. *grandifolius* Muell.-Arg.
common det. Porter 1974

1 78 *Cassia sophora* (L.) Roxb. det. Barneby 84
common

1 79 *Heliotropium indicum* L.
occasional

2 80 *Clerodendrum molle* HBK.
occasional var. *glabrescens* det. Moff.

3 81 *Sida spinosa* L. (det. H. Andersen 1978)
locally common

Jan. 27 - "New Road", Academy
Bay to Bella Vista, at the
last major escarpment toward
Bella Vista
On broken basalt

3 82 (fern) *Trachipteris pinnata* (Hook. f.) C. Chr. det. Porter 1974
common in crevices

shrub 1 m. tall,
flowers greenish white;
fruit scarlet.

large shrub; flowers
white, tube pinkish.
vine; flowers pink.

very common in
edges of forest.
flowers orange

prostrate; flowers orange.

shrub 1.5 m. tall,
flowers yellow.

shrub 2 m. tall.

low shrub; flowers yellow.

flowers white.

> *H. angiospermum* Murr. (det. P. M. Porter)

shrub 2 m. tall,
flowers white.
erect.

100 m

curls up in dry weather, expands
in wet.

44883 *Polyphodium tridens* Kunze det. Porter 1974
3 common in rock crevices

2 84 *Anredera ramosa* (Miq.) Eliasson det. H. & M. W. H. F.
common in rock crevices

1 85 *Peperomia*
common ~~in~~ on rocks

1 86 *Usnea*
hanging from branches
of *Psidium*.

1 87 *Psidium galapageium* var. *howellii* Porter det. S. M. Porter
common Dec. 1969

5 88 *Phyllanthus carolinensis* Walt. subsp.
common in crevices and
along road. carolinensis
det. D. M. Porter
1974

Jan. 27 - "New Road"
above Academy Bay,
dry cleared roadway
on rocks and heavy ~~soil~~ soil

3 89 *Portulaca oleracea* L.
common.

3 90 *Portulaca oleracea* L.
common

2 91 *Vigna Rhynchosia minima* (L.) D.C.
rare

1 92 *Physalis*
rare

5 93 *Heliotropium andersonii* Robins. (Det. P. M. Porter)
common on bare hard red soil

Twining vine, flowers
yellow, turning reddish.
— very fleshy, stems and
spikes reddish.

spreading tree 5 m. tall.

branches more or less
in one plane.

30-50 m.

prostrate, fleshy, no
flowers open in late afternoon,
with 44890 but not
intergrading with it.
— ascending, leaves large,
no flowers open in late
afternoon; with 44889
— but not intergrading with it.
prostrate, twining,
flowers yellow.
— flowers yellow;
fruiting calyx prominently
angled, strongly depressed at base.
— erect; flowers yellow.

- 44894 *Alternanthera halimifolia* (Lam.)
 2 on hard bare red soil
 2 95 *Euphorbia viminea*
 common on hard bare
 red soil
 10 96 *Froelichia juncea* Robins & Greville subsp. *alata*
 one bush seen on hard
 bare red soil

Ret.
 D. M.
 Standl. Porter,
 1975

Howell
 (det. H.
 Andersen 1978)

stems ascending.

~~to~~ flat-topped shrub,
 branching in one plane,
 stems brown, leaves
 fleshy, brownish green.
 much-branched
 shrub about 1 m. tall,
 fruiting stems arching
 and pendent at tips.
 (seed sample)

Jan. 27 - "New Road" from
Bella Vista to Academy Bay

This is a broad swath
bulldozed through the forest
from Bella Vista in almost
a straight line from the
corner of the clearing to the
head of the Bay. There are
one or two turns in going.

The road crosses about
4 miles - or, at least, is
a major fault. The other
may be fault or else
top of lava flows.

The upper part is very
disturbed close to the
village, with most of
forest cleared.

Then there is a rather
disturbed, or at least
open, evergreen forest -
Psidium, *Acacia*, etc.

This again is a mixed
character and is rather
uniform for some distance.

Below the village some
distance the edges are
lined with saplings of
what must be a species
of *Acacia*, though in habit
it resembles the enormous
Polynonia in Colombia -
stems not as thick. It seems
all sterile.

Ochromy
grove

At first this forest
was a dense herbaceous
undergrowth. After some
distance this thins out
somewhat. *Psidium*
still persists below the
uppermost escarpment.

A dense growth of weeds
occupies the road swath,
but much of this is
trampled so the weeds
are not very rank.

Sida rhombifolia, of a
particularly large-
leafed and robust form,
is most abundant.

The herb layer becomes
very thin about
half-way down, but
the canopy, for the
most part, remains
closed most of the
way to Academy Bay.
Its composition gradually
changes and *Bursera*
becomes more prominent,
while things like *Psidium*
dropout. *Pisonia* is
perhaps the most dominant
tree for the entire middle
part of the road. The
sharp zonation of the other
trails is not very obvious here.
The forest stays more or less
closed almost to Academy Bay.

but is
scrophulari-
near there

Jan 28 - helicopter flight
across Indefatigable I.
Academy Bay - ~~Balta Vista~~
- Table Mt. - Seymour I. 1:50 p.m.
Completed rolls of film & took
from air.

Aspect of higher parts
of island green, as much
from thick undergrowth
as from trees. Psidium and
Zanthoxylum trees are
brown, Scaevola bright light
green.

As soon as low plain on
north side is reached
the aspect becomes light
gray. The forest varies
from closed to open. Near
the coast are patches
with almost no vegetation
lava with red soil in
depressions.

Balta I. is almost
entirely modified by air
base activity. General
aspect is desert - red soil
& black or gray lava with
scattered trees & bushes.

A younger lava is more
vegetated and oxidized than
an older surrounding glassy, black.

From deck of USS Pine Island,
Baltra I. is essentially
flat, with 3 or 4 terrace
levels, topmost is completely
disturbed by old air-base.

Vegetation generally very
sparse, red ground showing
through. Some green back
of beaches - mostly Maytenus.
Scattered trees with white
trunks and branches - prob.
Bursera. This is densest
on the low area between two
higher terraces.

North Seymour is also
essentially flat, sloping
gradually from west up to
cliff on east. Vegetation of
Bursera seems much denser
than on most of Baltra.

Daphne Minor is surrounded
by cliffs, even undercut on
one side. Flat top has thin
forest. Dawson says this is
only on rim of crater and
is only Bursera.

Daphne Major is a
fine truncated cone,
scarcely cliffed at
all. Williams says
both seem very young.
He also says that on James

Jan. 29. Left ship by
Helicopter 7:00 am. Arr. 7:10

Island is mostly
wooded with a Croton
scrub up to 4 m tall

Small meadow-like
areas around periphery
and also have an
open dwarf scrub or
broad-leaf herb meadow
of *Alternanthera* sp.
which strongly resembles
Chenopodium *volucre*
about 3 dm. tall; rounded
compact bushes. A few
herbs between these
clumps - *Cyperus*, grass,
erect *Croton*.
Cacti in *Alternanthera*

Similar openings in
interior (photos 6 & 7)

Also three places in scrub
with many dead *Croton*
and some still alive
but much less luxuriant
than the surrounding
ones (photos 6 & 7)

On slopes - dip slopes of
tuff beds - open Croton
scrub with thin grass
and amaranth herb, no *Alternanthera*
(photos 6 & 7)

Mockingbird - nesting

Finches ?

Red-footed booby "

Masked booby "

(pink bill)

Frigate birds "

Sooty tern "

"large gull-like bird"

with gray back, black
head, white under parts
and a bright red ring
around eye, beak somewhat
hooked. " in this place
in interior.

Ground-dwelling, quail-like
pigeon ^{dark red bill} brown with white marks
on outside of wings white wing
patch when flying, bright blue ^{bill}
red feet, black bill ^{curved down at tip}
^{underneath greenish on sides}

The sooty tern nest
here even under the
densest scrub, although
more numerous in openings.
Even in cactus clumps.

There are one or more nests
of red-footed boobies in
almost every Croton bush.
Finch nests in *Alternanthera*.
Masked booby nest on
ground in openings and
in scrub.

A few young frigate birds.
Pigeon walks around on
ledges of canyon.

On these upper slope of the hill an open scrub with thin grass is general. In a shallow ravine are low clumps of *Opuntia* with soft yellow spines. A little *Alternanthera*. More grass, but grass cover thin and discontinuous.

Hill top is covered by thin croton scrub with an understory of *Opuntia* 1-1.5 m. tall.

In a narrow pass on far slope a colony of *Crotalaria* lutea, with a little grass and *Alternanthera*.

A deep canyon cut in harder tuff layers, now smooth, light gray. Sparse crotton scrub on walls, a little grass and *Alternanthera*.
Photo even, red.

Down in the canyon the *Alternanthera* is much more luxuriant than seen elsewhere, up to more than 1 m. high, in masses.

Beautiful view of mouth of canyon, lower

like rock (photo box + red).
On top red spots, thought to be plants with masses of red flowers - turned out to be male frigate birds with pouches expanded. ~~So~~ *Opuntia* around tops of cliffs. A little *Portulaca* on top ledges. But *Alternanthera* is most of cliff vegetation. A moss on peaty soil on ledge.

In canyon bottom several pools filled with rotting vegetable debris.

Forked tailed gulls making a noise, but wailing, squealing & whistling. Hundreds or thousands of red footed boobies. Several frigate birds. Many fowls & a few pigeons.

Many frigate birds soaring.

Canyon is cut deep into tuff beds, but ends in a cliff. Beautiful rocks below in water (photo red).

Very hot in canyon, boobies panting.

Many grown young ^{red footed} boobies not yet able to fly. brown.

Just to right (looking upstream) of the head of the canyon, is a large (2 acres) open slope, one half of which is covered by a well-ragged open scrub 0.5-1 m tall of *Desman* sp. *Croton* bushes with much *Portulaca* between them (photos). The other half is a low scrub open growth of *Alternanthera*.

Many marked boobies nesting here, with downy young. In scrub many green young of red-footed boobies (photos).

At about 3:45 p. m. a shower went by, and just a bit of the edge of it ~~was~~ hit the island. Great clouds of sooty terns were in the air while it rained, making a tremendous clamor.

The dwarf scrub of *Alternanthera* varies from open to closed. The individual clumps are 2-4 dm tall and 7-8 dm across, touching or separated by up to 1 m. Each bush has an

intricately branched woody basal part much smaller than the bush from which herbaceous shoots are produced in abundance. The association is principally the one before but the grass, the *Cyperus*, the *Ammanthus*?

Jan. 30 - around camp. Saw short-eared owl sitting between the bushes. Very tame, was watching a dove which circled about 3 feet from the owl, seeming not to be disturbed but keeping just that distance. Mockingbird.

Brown with conspicuous gray collar. Two of them played together, one pursuing the other with wild pecks. One sitting on top of tent pole and singing occasionally. One found a large centipede and harried it to death, pecking at its head, jumping back when the centipede struck, eating a leg when it detached one, finally dragged the centipede off.

Jan. 29 - north side above
~~bluffs~~ cliffs (camp)
 in Alternanthera meadow

44897 Alternanthera helleri
 dominant.

2 98 Cuscuta gymnocarpa Engelm.
 parasitic on Alternanthera

5 99 (grass) Eragrostis cilianensis (All.) Lutati det. Reeder
 locally common ^{Eragrostis major Host.} (det. H. Andersen 1978)

44900 (amar.)
 occasional

~~Croton~~
~~scouleri~~

same - in Croton scrub

5 {01 Croton
 5 {02 Croton scouleri var. darwinii Webstr. ^{det. D.M. Porter 1974}
 dominant

5 03 (grass) Eragrostis cilianensis (All.) Lutati det. Reeder
 in very small openings
 and thin places in scrub

5 DET. D.M. Porter 04 (amar.) Amaranthus scleranthoides (Anderss.) Anderss.
 common in small openings

5 05 (grass) Eragrostis cilianensis (All.) Lutati det. Reeder
 in opening

same - in Alternanthera scrub

5 06 (amar.) scleranthoides (Anderss.) Anderss. ^{DET. Porter 1974}
 occasional

5 07 Cyperus anderssonii Bockeler det. Koyama
 occasional.

140m

dwarf shrub or
 suffrutescent herb,
 2-3 dm. tall, grayish
 especially toward tips.
 yellow-orange, thread-like,
 sterile.
 small tufts.

delicate herb

Q
 ♂

shrub 2-3 m. tall
 aromatic when broken.

150m

wispy tufts.

small wispy tufts.

140m

stems red.

1974

Jan. 29 - near highest summit on island

44908 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
dominant in tall scrub

5 09 *Portulaca ~~abundans~~*
abundant on open slope

2 10 *Tribulus cistoides* L.
rare on open slope
dominated by *Alternanthera*
dwarf scrub.

5 11 *Portulaca*
common in openings
on slopes

5 12 *Portulaca howellii* (Legr.) Eliass. (det. H. Andersen 1978)
common in openings

5 13 (grass) *Eragrostis major* Host. (det. H. Andersen 1978)
Eragrostis alianensis (All.) Lutati det. Reeder
locally common on
open slope

14 ~~same~~ same - ~~same~~ canyon
at west end of island

6 14 *Cyperus anderssonii* Bockeler det. Koyama 1974
rare on upper ledges

1 15 (moss)
rare on cliffs at mouth, on peat

165 m

sterile young plant
to show large leaves.
fleshy herbs, stems
ascending, gray at
base, red above,
flowers yellow, about
1.5 cm across, open 10:30
on, petals emarginate,
stamens about 20, style
branches 4-6, mostly 5.
prostrate, flowers
yellow, about 1.5 cm across.

160 m

ascending,
fleshy, stems brownish-gray
at base, brownish green
above, flowers yellow.
fleshy, stems prostrate
at base, tips ascending,
base gray, distal parts
brownish green, buds
yellow.
tufts

150 m

tufts.

140 m

soil.

bright green.

~~Jan 29 - North side~~
~~Culpepper I.~~

44

44916 *Alternanthera helleri*
 common on ledges

Erythrina velutina Willd.

Jan 29 north side

2 44917 *Erythrina velutina* Willd.
 with E. Y. Dawson
 rare, only 2 trees seen

Jan 30 - northwest side (camp)
 in *Alternanthera* dwarf
 scrub.

5 18 *Cenchrus platyacanthus* Anderss. det. Porter
 common on slight
 rocky escarpment.

4 det. Porter 1975 19 *Amaranthus scleranthoides* (Anderss) Anderss
 common in spaces
 between *alternanthera*

1 20 grass *Eragrostis cilianensis* (All.) Lutati det. Reeder
 common in spaces between
Alternanthera

1 21 *Alternanthera helleri*
 abundant

dwarf shrub 4 m. tall.
 herbaceous branches
 from woody base.

135 m

sterile tree.

140 m

seedlings only. old
 fruits abundant on
 ground. Old coarse
 stems dried and decayed
 seen here and there.
 stems reddish.

seedlings.

Jan. 30. camp - cliff

Finches probed bread
in cactus flower.

Said to be several species
but hard to distinguish.
Geospiza difficilis in one
tree. In *Alternanthera*.

Immature red-footed
boobies seem to be sitting
on nests with eggs.

Along the coast to the
west of camp the crotan
scrub is rather open
varying from closed to
at least as open as
70% coverage occasional
areas completely open.

There is a fairly complete
ground layer of *Alternanthera*
varying from closed to open
(photos). In some openings
in the scrub this layer
is sparse or absent. Terns
are abundant generally,
but those in openings are
mostly just resting while
those in at least partial
shade have eggs or chicks.
Chicks vary from newly
hatched to having wings
feathered out. The red-footed
boobies are abundant
in the trees, with eggs or

young. Occasional
frigate bird resting on
ground or on sticks,
mostly immature.

On the outer edge, above
the cliffs there is a space
where the vegetation is
sparse or lacking for
a few meters. For
considerable distances.
Few marked boobies are
nesting in abundance
with eggs, newly hatched
young, some downy young.

The scrub varies in
height but is mostly
2-4 m. and the trunks seldom
reach more than 6 cm.
Many dead bushes still
standing, but easily
tipped over.

Exposure of very coarse
porphyritic basalt on
n.w. corner. Cor drilling
it for paleomagnetism measurements.

Vegetation on cliffs
mostly *Alternanthera*,
some crotan. ~~There~~ some
male frigate birds on
cliffs with distended
pouches.

Many tern eggs with holes
cracked in them.

Headland covered by
Alternanthera, with
scattered Portulaca and
patches of Amaranthus.
Hundreds of smashed boobies
nesting. One Forked Tailed
Sulphur, nestling, had to be
pushed off to see egg.
Egg pale blue-green, ~~marked~~ with
gray and very dark brown. (photos)
Under an Opuntia bush
(collected) (photos)

South of this is an
area of bare ground
with scattered crotin
a few Portulaca and
Alternanthera, and
hundreds of smashed
boobies. (photos)

This gradually changes
to thicker scrub and
the boobies are replaced
by terns, great numbers
of them, with eggs & chicks.
Then a small completely
bare place, where terns are
just sitting.

Took soil sample 3 in
this - almost black
fine soil, 2-4 inches
thick on rock.

Nearby is fairly dense

Croton scrub 2-4 m. tall
sample #4, also just
a superficial layer 2-4
inches deep, of black
soil, with many roots.

Back by the camp
took soil sample #6-7-8
in ~~an~~ Alternanthera
scrub, top layer is
nearly black, next layer,
3" deep, is reddish brown,
this is on rubble material,
rather rotten. #8 is
also reddish to yellowish
brown.

Sample 9 is from
within dense Croton
scrub back of camp.
Here only a layer 2-4"
deep on rock, black
on top gradually
becoming browner
downward.

Sample #5 is lava
from N.W. point

Sample #2 is rotten
tuff from top of cliff
on W. side of deep canyon
at its mouth.

Jan. 30 - ^{south?} ~~northwest~~ headland
of island.

Det. Porter 1975

- on open top of bluff,
in ~~alternanthera~~ scrub.
44922 *Amaranthus scleranthoides* (Anderss.) Anderss.
5 locally dominant
2 23 *Portulaca*
common

- 2 24 *Opuntia* cf. *helleri*
isolated clump

Jan. 30 - east of camp
in opening in *Croton* scrub
det. D.M. Porter 1974

- 1 25 (grass) *Eragrostis cilianensis* (All.) Lurati
common
1 26 *Croton scouleri* var. *darwinii* Webstr.
abundant

det. D.M. Porter
1974

140 m

↓

stems from clear green to
clear red in same colony.
- ~~stems~~ plant fleshy,
stems reddish, gray
at base, ascending,
flower's 1.5 cm. across,
petals emarginate,
stamens about 20.
- clump about 1 m. high,
spines stiffer on basal
joints, yellow, soft ~~white~~
on upper joints, flowers
yellow, fruits caducous.

seedlings

Jan. 30 - coast east
of camp
area of *Croton*
scrub with a
without *Alternanthera*
with a without
scattered *Alternanthera*.
One *Erythrina* tree
about 40 cm tall.

Heard a cry
of very open *Croton*
with *Portulaca*
covering much of
the ground between
trees. Starting to close at
2:30 p.m. Last grass

Melching birds nest
in *Erythrina* 3 beautiful
green blue eggs spotted
with dark brown on
large end. One bird
sitting. Other brought
a cricket. He attacked
me. pecked me head
when I disturbed the
sitting one. Both
made quite a fuss.

Immature gull
pecked grass while
above, red eye ring
eye beak entirely black.

Cenchrus

Poa?

Amaranthus:

Alternanthera

Portulaca

Cyperus

Erythrina

Tribulus terrestris

Croton

Cuscuta

Probably a ^{dynamic} ~~successional~~
relationship between
concentrations of birds
over a period of time and
destruction of *Croton* scrub.
Birds tend to occupy the
openings, slowing down
vegetation. *Portulaca* & grass
seems to do best in open
in spite of birds. Little
tendency evident for
Croton to invade
Alternanthera dwarf
scrub. But where
Croton is thin, *Alternan*
thera forms an understory.

Jan 20 Left Culpepper
at 5:15 pm. In Wenman
On arched rock near
culpepper, is open vegetation
on flat top.

Wenman I. - sandy
flat topped island off
shore and flat part
of main island covered
by a thin open *Croton* and
the bushy 2.5-5m. tall,
fastigiously branched,
leaves 14-18 ~~cm~~ long.

Stems seldom exceeding
3cm dbh.

There is an extremely
rough boulder ground,
but under surface layer
of boulders is a layer
of black soil.

In much of the
scrub there is a prominent
ground layer of *Alternanthera*
but in places there is
nothing. *Opuntia* is in
places abundant, up to 1m.
or so tall, in places scattered,
in places lacking.

Spacing of the *Croton*
is generally from 0.5 to
1.5m but crowns are so
sparse and narrow and
irregular that coverage

is very incomplete.

Large openings or open
sparse places in the scrub
are dominated by *Opuntia*
but have *Spergularia*, *Portulaca*
condens, possibly
Borreria scandens (too
dried up to be at all sure),
Alternanthera, and
in lower wetter ones,
Cyperus & *Hydrocotyle*.

Center of area, in a
rather sparse place,
a male frigate bird, with
red powder, sitting on
eggs early afternoon.

In central part of
area about 2/3 of *Croton*
are dead, mostly fallen.

Here there are no boulders,
only sharp pebbles & cobble
size debris lying on soil
surface.

Scattered clumps of
Alternanthera and patches
of *Cyperus*.

Here the red footed boobie
& frigate birds are nesting
in fallen trees rather
than standing ones. Some
are fallen while still alive.
There are fresher dead ones.

Jan. 31 - ~~nat~~ corner

in thin Croton scrub

44927 *Sporobolus linearifolia* Hook f. (det. H. Andersen 1978)
occasional in opening

5 28 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
dominant

5 29 *Alternanthera halleri*
very common generally

1 30 *Portulaca*
rare in open area at top of cliff

1 31 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
dominant

5 32 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
dominant

2 33 *Mollugo gracillima* Anders.
in earth filled interstices
between lava boulders in
opening

5 34 *Cyperus aristatus* Rottboell det. Koyama 1974
abundant in earth-filled
interstices between lava
boulders, in opening

5 35 *Cyperus anderssonii* Böckeler det. Koyama 1974
common in opening

5 36 *Portulaca*
abundant in opening
also seen at tops of cliffs

100 m

↓

extensive vine; flowers
pale lavender with
- deep purple center.
slender shrub 3 m. tall

bush 0.7 m. tall, woody
- up to about 0.4 - 0.5 m.
sterile

slender shrub 3 m. tall

shrub 3 m. tall, sap
- reddish, somewhat watery.
sterile

erect tuft

fleshy plants,
stem ascending, gray
at base, reddish, flowers
2 cm. across, yellow, petals
emarginate, stamens 22-24,
style branches 3-5, mostly 4.
fls open mid-morning to at
least midafternoon.

all pointing more or less
and other directions.

On east side of flat
peninsula a group of
Erythrina lining top
of cliff. A trail of
this season. Varying from
tree to tree in response.

A red footed booby ~~was~~
sitting on egg in one of
these trees. A pair of Geospiza
difficilis were fighting
on its tail and pecking up
under the upper tail feathers
and, pulling aside the
wing tips. I saw little
while they did, but would
flick its tail. The female
would jump aside, but
wipe its beak, then return.
This kept up for 15 minutes
or so. I thought it was
insects they were after,
and since they pecked
about on the feathers, it
may well have been.
However, close examina-
tion showed that the area
at base of main tail
feathers was bleeding
and the birds were
mostly pecking at the blood.

Birds seen

Red footed booby

Mashed booby

Frigate bird

Mothus bird

Doves

Geospiza difficilis

Geospiza sp.

Forked tailed gull

In the Erythrina grove
which is a couple of
hundred yards long
and 50 or more wide,
the ground is covered by
a continuous layer of
pebble to cobble size fragments
under which is a 15 cm.
layer of black fine soil.
then rubble & clay.

Locally there are
enormous, irregular
boulders, but in places
between and among
seedlings and young
plants of a number
of species not or scarcely
seen elsewhere, some in
numbers, others rare.

is red-billed
white
decidedly

Around cliffs on a
side ~~the~~ white-tailed
open bird - back red!
Several forked-tailed gulls.
Handfuls of masked boobies
nesting on edge of cliffs
at least half way up
mountain.
Geopieps difficult of killing
around the base each.

On this ridge, and
more especially at the
foot of the talus below
at the very edge of the
cliff, *Scaevola* is rather
only a few inches - gnarled
sprawling stems with
clumps of compact branches
at ends - the whole not
much over 1 m. tall.
Associated with stunted
Croton, some *Portulaca* and
abundant *Alternanthera*.

On other side a colony
of *Heliotropium* seen
in from cliffs in rather
dense *Croton* scrub.

Cliff top more or less
bare, nesting place for
countless masked boobies.
Alternanthera, *Croton*, *Portulaca*

Narrow *Wenman* is
a knife-edge, with
some three plants.
Wenman is flat
topped and covered by
Croton scrub.

Photos of *Croton* to
show fastigate habit.

Steep talus on east
side at base of cliffs
of high crag - open
Croton scrub, with
some *Opuntia*, and an
open shrub layer of
Alternanthera, a few
scattered *Scaevola* bushes.

From high on main peak -
peak - *Alternanthera* and
diagonally across from
Erythrina give that
seems to have larger
Croton (photos blue book)

Jan. 31 - West side
in Croton scrub just
back from cliff

44937
5

Heliotropium parviflorum L. →
small colony

Jan 31 - east side

~~edge~~ at top of cliffs

10 38

Scaevola incisa Hook. f. <sup>*Scaevola bauvii*
ssp. *hopkinsii* (Robins,
Eliass)</sup>
a few bushes at foot of talus
on cliff edge. (det. H. Andersen
1978)

6

39 *Alternanthera helleri*
dominant on talus

5

40 *Scaevola incisa* Hook. f.
on ridge <sup>*Scaevola bauvii* subsp. *hopkinsii*
(Robins, Eliass)</sup>
(det. H. Andersen 1978)

Jan. 31 - east side

in *Erythrina* grove

5

41 *Acalypha*
locally common

1

42 *Heliotropium parviflorum* - →
rare

14

43 *Cardiospermum corindum* L. det. H.
very local

5

44 *Erythrina velutina* Willd.
dominant

2

45 lichen
on branches of *Erythrina*

120 m

H. angiospermum Murr. (Det. D.M. Porter)

small shrubs up to 0.6 m. tall.
flowers white, eye greenish.

gnarled bush ^{0.8 m. tall} with
compact clumps of foliage
at ends, involueral
bracts maroon at tips, rays
& disk white.

140 m

densely branched
bush 0.4 m. tall.

150 m

gnarled bush 1 m. tall,
densely branched at
tips. flowers white.

100 m

^{sterile}
H. angiospermum Murr. (Det. D.M. Porter)

M. Porter
1970

climbing in undergrowth.

thorny tree 5 m. tall,
widely spreading
pods and ~~seeds~~ beans from
ground.

- 44946 *Flemingia aestuans* Gaud.
common
1 47 *Galactia*?
rare
1 48 *Rhyssalis* cf. *angulata*
rare
2 49 *Amaranthus*
occasional
1 50 *Ipomoea*
rare
1 51 *Ipomoea*
occasional
1 52 *Ipomoea*
rare, 1 plant seen
3 53 *Setaria*
rare

Jan. 31 - center of north
plateau

- 2 54 *Cyperus*
common in sparse
open area in Croton scrub
5 55 *Cenchrus*
common in sparse to
open area in Croton scrub
5 56 *Ipomoea*
abundant in sparse to
open area in croton scrub
climbing over *Opuntia*

- all plants young
all plants young
seedling only, seen.
all plants young
seedling only
seedlings only
seedlings only
erect tufts

erect tufts

seedlings only, seen.

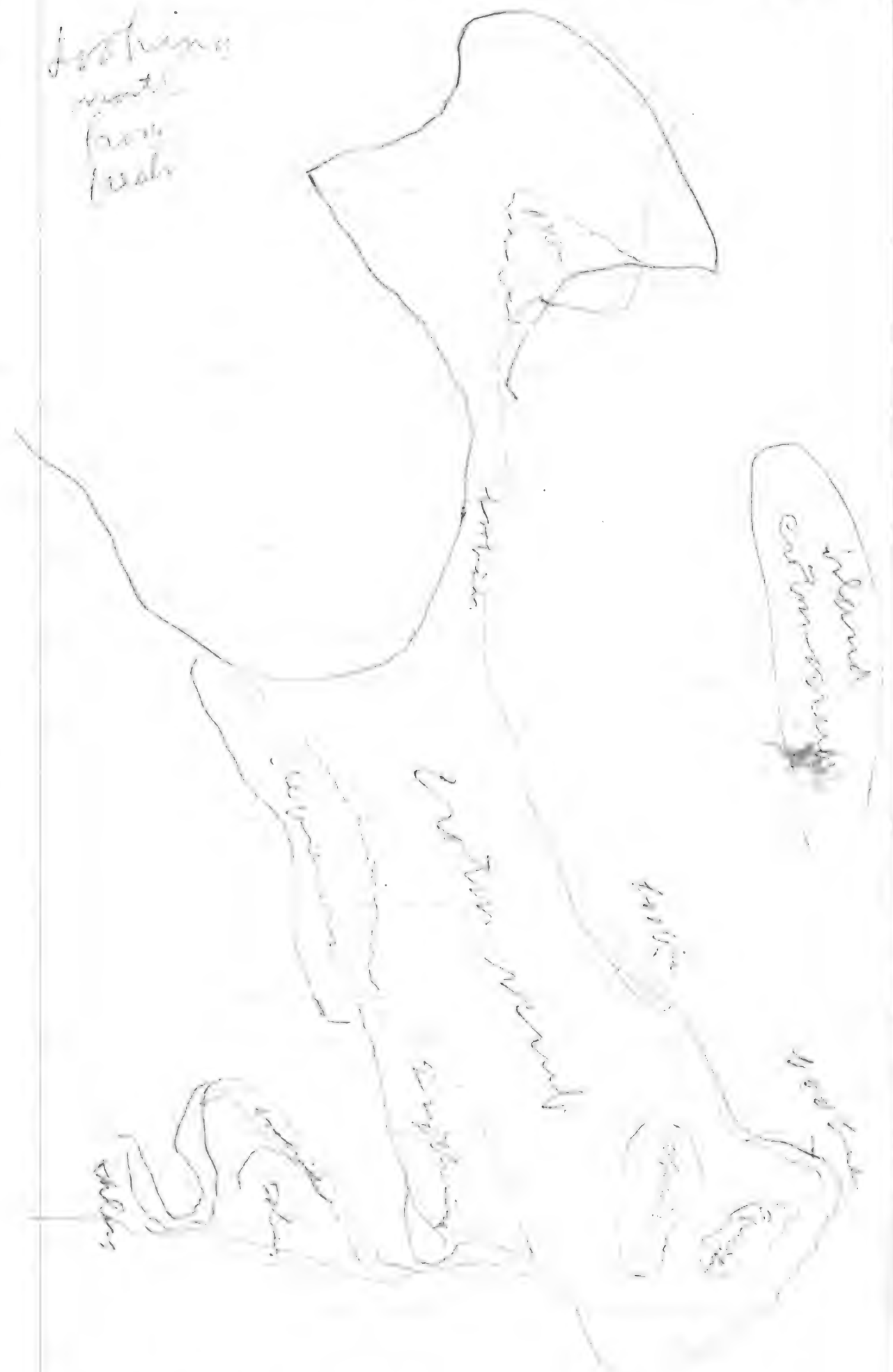
vine, flowers white, with
red to center

First summit -
covered in thin scrub
of *Croton* with a sparse
ground layer of *Alternanthera*.
There, some *Portulaca*,
a few other herbs, a
few scraggly bushes
of *Cordia alliodora*, some
Opuntia, a ~~few~~ very
few small bushes of
Scaevola.

The small cirque like
hanging valley on
the west peak appears
a bit more mesophytic -
but still great
Croton scrub.

Difficult to reach
because of a sharp
knife-edge there is
a 2 m vertical rock
ridge with no
apparent hand or foot
holds.

The deep almost vertical
canyon between the two
on the west side has
some seepage spots
with perhaps a grass
ridge not collected
and on the talus in its
bottom a plant not
recognized - perhaps a dependent
Alternanthera. The *Scaevola*



in the seepage spots
has larger leaves

10.1 reptiles rocks
point of island
blue lizards, a small
man in iguana
Toucan, whistling, calling
washed body (many) for bird
trails and (many) Geopiza
affinis. No nodules seen
but reported from here
yesterday by others.

Only vegetation a few allamoa
there bushes + Opuntia on cliffs.

Crabs seen only on the
side of island. Also
man in iguana.

Yesterday saw patches
neat looking, curved
wings, black above,
white beneath, flying
in and out of cliffs
of long peninsula.

- 1 Phosphatized (?) tuff from
surface of ground, Culpepper?
- 2 rotten tuff from near mouth of
large canyon.
- 3 black soil from bare spot
in Croton scrub, center of I.
- 4 black soil from ~~barren spot~~
in Croton scrub, center of I. near #3.
- 5 ~~black soil from Croton scrub,~~
~~near #4.~~ Coarse basalt.
- 6 soil sample - black
soil from ~~Croton scrub~~ ^{near} ~~I. 7-9.~~
- 7 soil sample, Culpepper?, in
alternanthera scrub, surface
- 8 same middle layers,
red-brown.
- 9 same partly weathered
parent material
10. 11 man!
- 10 black soil from under
pebble layer in Erythrina grove
- 11 crust on lava in overhang
near top of peak.
- 12 purple surface on lava
near top of peak
- 13 ~~beachrock~~
beachrock
- 14 beachrock and sand.
Narborough I.
- 15 blue material from ground.
- 16 Pumice from 1000' alt. pumice field.

Feb. 2 - Reconnaissance
helicopter flight - Roca
Redonda, Narborough,
north part of Albermarle.
started 6:40 am.

Roca Redonda is a tiny
flat topped rock several times
as long as wide and at least
as high as wide, perhaps
higher. Top is whitish and
not rough, perhaps phosphat-
ized. Sides rough, some
layers roughly columnar
jointed. Only trace of vegeta-
tion is what seems to be green
algal staining in places
on the sides, esp. the west side
and north end. Many
hundreds of forked tailed
gulls seen, several frigate
birds and red footed boobies.
Albermarle I.

~~Narborough I.~~ - west
peak is a high plateau
with forest on top. Separated
from other part by a barren
lava isthmus with
conical craters of Moch.
Esp. on N.W. side there is
green veg. above the basal
flows. On cone on W. side
is open sparse *Bursera*,
esp. in craters.

On sides of main cone
above basal flows, also,
sparse *Bursera*, etc.
On lava flows nothing
small ponds on
lava near S. shore.

At base of steep scarp
on alluvial fan some
bright green vegetation.
The top and sides of
this mountain would
repay exploration.

Narborough I. - north side.
Vast lava flows at foot
and on lower slopes. some
show several small trees
patches of trees, patches of
grass, bits of mangrove
fringe. white sand beaches,
many ponds and
complicated shore line
with mangroves and
some sand strand veg.
Clumps of short *Cereus*
in crevices of lava flow.
This is Punta Espinosa.
Landed at 7:25.

main
iguana *Rhizophora* and *Laguncularia*
around salt water ponds.

Took off at 7:35
cluster of little cones
on lava flows
Near base of mountain.

bipubas of what appears to be *Bursera*, very sparse.

Some slightly older flows and bipuba with a few short *Jasminocereus*?

Toward other side clusters of new cones and bipubas of

rather dense *Bursera* forest. As we go around the bipubas become greener and greener.

but many are on newer lava and still not very vegetated.

There even on new lava scattered cacti. But nearer coast nothing on ~~new~~ new black lava.

On older gray lava scattered bushes and cacti, green bipubas.

Visit lava beds with scattered bipubas and on older part, scattered cacti.

Small clumps of cones scattered around - brown landscape.

The farther around we go the greener the bipubas.

On s.w. side the slope is green above the lava flows. Many bipubas are small cones.

Whole flower, from base of mts. to sea are green, open part, probably *Bursera* with some bush. This on s.w. side.

The flows become greener away from sea.

On side of mountain the vegetation seems to be a green scrub, with trees in lower places and ravines. Worth an extreme effort to get up to the zone.

Mountain top seems flatish, covered by low forest.

Many tiny cones and narrow flows.

Patches of grass with trees, mostly an almost closed forest with a grassy growth - some *respirans* shrubs? between trees.

Large forest, the upper part is mixed, much of it *Salvia*.

All of this on west side of crater.

Some water in bottom of crater but not a real lake. North ^{west} slope steep, ~~mostly~~ lava flows. Many vegetated bipubas lower down, some rather

high - The lower no leafless, the higher no green. Some veg. on lava.

Top of north side also wooded plateau upper bipubas green lower leafless but dense forest. No veg. on lava.

Lava pool in bottom of crater, also a large cinder cone with a green lake in its crater. Nothing on lava pool. Some water in places on surface of lava pool, esp. toward west side.

On ^{note} east side the uppermost bipubas are lush and green, closed forest, become more open and less green downward to almost barren ones on lava plateau at base. These lower bipubas are brown against black new flows.

No mangroves along coast here at all, except at and near Punta Esfirova which is an extremely complicated bit of coastline.

Crossed channel to Albemarle. Saw against us.

Very complicated forest enclosing a lagoon on west coast at about center. Beaches here are

gray. Some very small bits of green vegetation - mangroves.

Lava flows on this side are rather - or completely - barren. Some scattered cacti or older ones and bipubas. - large cereus scattered on upper surfaces.

Crossed second saddle. Here are many but widely scattered cacti with a few other trees.

This slope of second mountain to left of us, bright green upper bipubas and slopes to right in interior have considerable vegetation - largely deciduous, just coming into leaf. This especially in bipubas, which are very numerous.

Slopes of second mountain are less green toward east coast, but a wide plain here is vegetated except at extreme coastal strip. Bipubas along coast are sparsely & openly vegetated. Flows have scattered cacti and small trees, but are generally barren.

Ridge in coast has nothing or flows, very thin vegetation in bays. Extreme coastal bays have nothing. One bit of mangrove around a tiny bay and to it, and several mangrove trees in ponds back of shore just to left of cove.

Feb. 2 - Duncan? seen from ship

gentle slopes, thinly vegetated, low sea cliffs on n.w. side, higher on s.w.

Nothing that looks from a distance like forest. Yet no very unweathered lava. General gray-brown to very slightly greenish appearance. Perhaps thin grass & low scrub [is scrub]

A large crater still visible.

Feb. 3 - left Paltia for Narborough at 11:50 by helicopter. Flew over Daphne Major. Scattered low Opuntia in crater, some on outer slopes. also ~~low~~ bare bushes. Otherwise thin grass, etc. Bottom of crater is a flat with no vegetation, apparently a pale gray or buff ash, but probably caked by water. (photos).

A number of small islands or rocks east of ~~the coast~~ for James? - photo with helicopter. These islets are rather barren. Looking from a distance.

A small slightly elongate rock and others, in a group of 3, have almost no vegetation - very thin dry grass (or lichens?).

Tower I. (?) - barren - looking but apparently has a deciduous scrub vegetation and Opuntia. Prominent yellow patches seem to be either a yellow tuft or another, prostrate, Opuntia.

Feb. 1 - summit peaks
and plateaus

44957 *Scaleria*

occasional

58 *Cardiospermum corindum* L. det. D. M. Porter

on plateau

59 *Ipomoea*

common on plateau

60 *Cordia lutea* Lam.

rare, a few scrappy
bushes on rocky summit

61 *Heliotropium parviflorum* L.

occasional on rocky summit

62 (grass) *Eragrostis cilianensis* (All.) Lutati

det. D.M. Porter
1974

rare in crevices on rocky summit

63 *Cyperus anderssonii* Böckeler det. Koyama 1974

common on rocky summit

(abundant in places on plateau)

64 *Portulaca*

common

65 *Cuscuta gymnocarpa* Engelm.

very rare, parasitic on
Alternanthera (and slightly
on *Mollugo*)

66 *Ramalina*

very common on crevices

same - on rock ledges and
crevices just below summit

67 *Euphorbia nummularia* (Hook. f.) Burch

occasional at base of cliffs

230 m

shrub, flowers white.

vine, flowers white.

seedling only collected

shrub, corolla yellow.

flowers white

H. angiospermum Murr. (Pet. D.M. Porter)

fleshy, lower stems
gray, upper red; flowers
yellow 2 cm across, petals
emarginate, stamens 25-27
style branches 4-5.
pale range threads;
flowers white.

210 m

det. v.d. W. little, glaucous, branches
more or less in one plane.

Det. D.M. Porter
1976

- 44968 *Amaranthus scleranthoides* (Anderss.) Anderss.
common on ledges and talus
- 1 69 *Alternanthera heckeri*
abundant on ledges and talus
- 1 70 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
common
- 5 71 *Heliotropium angiospermum* Murr. (Det. D. M. Porter)
rare in crevices
- 6 72 *Mollugo gracillima* Anders.
common on ledges and in crevice.
- 5 73 *Flourensia aetnensis* Paul.
very common in on ledges and talus.
- 3 74 (grass) *Eragrostis cilianensis* (All.) Lurati det.
occasional on ledges and talus
- 75 *Croton scouleri* var. *darwinii* Webstr. det. D.M. Porter 1974
abundant on steep ridge and talus

Feb. 1 - on north point
in terraces

- 76 ~~*Amaranthus*~~ abundant in
openings in *Croton* scrub

Feb. 2 - Punta Espinosa
Marbrough?

around lava pools

- 77 *Rhizophora mangle* L.
local, growing in salt water on lava
- 78 *Laguncularia racemosa* (L.) Gaertn.
local, growing in edge of salt water on lava.

200 m

stems red.

small shrub,
grayish green.

210 m

shrub 1.5 m. tall

(extreme leaf size)

dwarf, shrub, flowers white.

petals 4-5 patent, white;
plant diffuse.

200 m

stinging

Reeder

shrub 2 m. tall.

100 m

decumbent with
ascending branches,
spine on upper joint,
very weak, yellow;
fruits green, profliferous.

shrub 3 m. tall.

shrub 2 m. tall.

Central Albemarle -
vast flow slopes reaching
far up the side of the volcano
before the break in slope up
to the main cone.

Bits of mangrove locally
along coast. Vast areas of
old flow with open to closed
Bumelia forest, beginning to turn
pale green up slope. Sparse
on less weathered lava, and
only scattered trees in the
darker flows. No really new
lava here.

Upper part of this forest
quite green, very mixed
and closed but rather thin.
Much long Usnea on trees.
Canopy surface very irregular.
Many shades of light green.

Then a very rough lava
field - aa. with scattered
trees, smaller bipulbas
will' forest, some places
almost nothing.

Other slope, beyond this
aa, similar to upper part
of east side, but gets more
and more bare downwind.

But here change is spotty
some large green trees and
many small bare ones.
No more Bumelia even
down near shore.

Narbrough I. - Considerable
mangrove around large
pools and on beaches for
a short distance along shore
where we crossed. Then bay
lava of several ages with
no vegetation for a long
distance. Then a rift with
scattered elongate breached
cones - new. Then older lava
with scattered Cereus and
small green bipulbas. 2
more rifts. More new
lava but with green
bipulbas of several ages.
Alternating flows of
different ages: some green
most brown with scattered
vegetation, some with almost
none. More rifts. Many
bipulbas. Then a strip of
green, very wide.

Feb. 3 - s.w. slope of Narborough? 1000

Sparsely to well vegetated
lava, with *Bursera*
and *Zanthoxylum* trees
scattered, more densely
in lower spots.

Sparsely shrubby layer of
Psychotria, *Cordia*, *Solanum*, *Euphorbia*,
etc., many ferns
Pilea, *Polka*, *Polka*, *Polka*,
Acalypha, *Setaria*, etc.
on ground.

Trees more abundant
near base of small cone,
here *Psychotria* and *Solanum*
are common under trees,
not very common in
open lava. Several
vines in trees, bushes

Carpenter bee seen visiting
Psychotria and *Rhynchosia*.

Pumice field - (photob. 1000)
grassland dominated by
Bruteloua but with *Paspalum*
abundant also.

Plant list

a	<i>Bruteloua</i>
G	<i>Paspalum</i>
la	<i>Rhynchosia</i>
a	<i>Alternanthera</i>
n	<i>Pectis</i> ?
O	+ <i>Ipomoea</i>
la	woody comp.
O	<i>Cordia</i>
C	<i>Salvia occidentalis</i> Sw.
	<i>Cratogeomys</i>
C	<i>Cyperus</i>
O	<i>Cyperus</i>
C	<i>Cyperus</i>
la	+ <i>Cuscuta</i>
nc	<i>Chilanthum</i>
nc	Other fern
O	<i>Opuntia</i> cf. <i>saricola</i>
O	comp.
C	<i>Cenchrus</i>
la	<i>Cissampelos</i>
O	<i>Zanthoxylum pagara</i> (?)

- r Bonneria
 e Aristida
 ec Acalypha
 ^ Lippia
 ^ Phyllanthus.
 ^ Chiococca alba (L.) B.
 o + Crotalaria
 ^ Psidium galapageium Hook. f.
 ^ + Bidens
 c Setaria
 la Waltheria
 o Cassia
 o Psychotria
 L + Lotus?

The vegetation is generally closed rather bushy, grass dominant but with a considerable herb component.

Locally abundant a sparsely branched arching cordlike (comp.) shrub, elsewhere Waltheria.

Abundant vines are Cissampelos Rhynchosia, locally blanket out other plants.

Alternanthera forms mats, locally crowding out the grass.

Salvia small patches

Small outcrops of lava occur scattered through the pumice field. In these the 2 ferns are common; Flemingia rare. Cyperus cf. inermis only seen in grassland on pumice on top of one of these outcrops.

Principal grasses,
in order
Panicum
Paspalum
Setaria
Aristida

Around the margins scattered Bursera graveolens.

Photos (b & c) from cone to n.w. also photo out toward sea, and one of scrub of cord-like composite shrub.

With it, brown Polypodium Bonneria, Cordia, Cereus, Rhynchosia, Froelichia, Lippia, Mollugo, Acalypha, Paspalum Zanthoxylum
Bursera on inside of cone.

Feb. 3-5 - southwest slope
in broad green strip
running from summit to sea
on well vegetated aa lava
with pumice in the cavities

44979

Phoradendron

13

parasitic on Croton

5

80

Croton scouleri Hook. f. var. scouleri det. Porter 1974

rare

5

81

Acalypha

common

5

82

~~Ph~~ Tournefortia pubescens Hook. f. (det H. Ander ^{sen 1978})

rare

5

83

Cyperus

local on pumice pocket

5

84

Cyperus anderssonii Bockeler det. Koyama 1974

local on pumice pocket

15

85

Cyperus aristatus Rottboell det. Koyama 1974

local on pumice pocket

5

86

Fleurya aestuans Gand.

common

3

87

Doryopteris concolor (Langsd. & Fisch.) Kunth det.

occasional

1

88

Phyllanthus carolinensis Walt. subsp. carolinensis

~~rare~~ occasional

1

89

rare

1

90

Heliotropium parviflorum L.

rare

5

91

Acalypha

common

5

92

Croton

rare

1050'

300 m

large bush, reddish green.

tree 4 m. tall

dwarf shrub.

shrub 2 m. tall

flowers white.

culms spreading.

culms erect, spikes reddish.

stinging herb

Porter 1974

det. D.M. Porter
1974

branches more or less

in one plane

flowers white, on recurved

pedicels, petals ~~apopetalous~~

apopetalous, ovary inferior.

flowers white.

tangled dwarf shrub.

small tree, 4 m. tall, with
erect branches.

- 44993 *Adiantum*
common in crevice of rock
- 7 94 *Passiflora*
occasional climbing in small trees
- 3 11 95 *Cassia pistaciifolia* var. *picta* (S. Don) ^{det. O.M. Porter}
~~Cassia~~ ^{det. O.M. Porter} 84
occasional
- 2 96 *Polypodium tridens* Kunze det. Porter 1974
epiphytic, common
- 1 97 *Lida hederifolia* Cav. ^{det. O.M. Porter}
rare
- 3 98 *Asplenium oerolun* Sw. Det. Porter
local in crevices and
cavities in rock
- 2 99 *Adiantum* ^{concoloratum Hall}
occasional in cavities in rock
- 45000 *Chiococca alba* (L.) Blake
rare
- 5 01 *Polypodium tridens* Kunze det. Porter 1974
common in cavities in rock
- 5 02 *Passiflora suberosa* L.
occasional, climbing in trees
[from with linear lobes]
- 5 03 *Commelina diffusa* Burm. f.
common in shade
- 2 04 (comp.) *Brickellia diffusa* (M. Vahl) Gray
rare in shade
- 5 05 *Pilea baueri* Robins.
common in shade
- 6 06 *Froelichia nudicaulis* var. *lanigera*
occasional

vine

shrub 2 m. tall
flowers deep chrome yellow.

prostrate, flowers range.

shrub 3 m. tall; fruit
white when ripe.

det. Porter

vine, flower with calyx
pale green, no corolla
corona filaments whitish,
yellow distally, disk and
gynophore purplish, very green;
fruits immature.

det. Porter

prostrate, flowers
pale purplish, closed
in afternoon.
flowers dull buff

erect, stems reddish.

low much-branched
bush. (seed sample)

- 45007 *Spermacoce ericifolia* (Hook. f.) Forst.
occasional
- 5 08 *Paspalum galopogeium* Chase ^{galopogeium} var. n. ^{det D.M. Porter 1974}
abundant
- 6 09 *Psychotria rufipes* Hook. f. ^{det Porter}
abundant, mostly under trees.
- 6 10 *Solanum erianthum* D. Don
very common
- 5 11 *Cordia leucophylla* Hook. f. ^(det. H. Anderson 1978)
occasional
- 8 12 *Solanum (Lycopersicon) cheesmanii*
common
- 5 13 *Asplenium*
abundant in cavities in rocks
- 5 14 *Lippia rosmarinifolia* Anders. ^{det. M. A. Drake}
common
- same - on open aa
lava flow with scattered
vegetation
- 7 15 *(Solan.) Acnistus ellipticus* Hook. f. ?
rare
- 5 16 *Cheilanthes sulphurea*
common in cavities in rocks
- Notholaena galapogensis* Weatherby & Svens ^{det. Porter 1974}

- erect dwarf shrub:
flowers minute, 4 parted, white.
clumps, culms more
less erect.
- diffusely branched,
rather tangled shrub,
to 1 m. tall; flowers
white, fruit red, fleshy.
~~leaves green~~ spreading
shrub, 1-1.5 m. tall;
leaves green beneath; flower
pale purplish.
- shrub, many stems
from base, 2 m. tall;
flowers white.
- diffuse herb, flowers
yellow, ripe fruit greenish
yellow, soft, slightly
acid with rather poor flavor.
(seed sample)
- flowers pinkish to yellowish pink
shrub 1-2 m. tall (others
seen tree-like, to 4 m.)
- small tree 4 m. tall, brittle.
fruits immature

- 45017 (anclaf) *Sarcostemma angustissima* (Anderss.)
(det. H. Andersen 1978)
common

- 3 18 *Paspalum galopogon* Chase var. *galopogon*
rare

- 5 19 *Spermacoce*
common

- 7 20 *Scaevola affinis* ^{loc 174} Hook. f.
common

same - on small spatter
cone with much ~~so~~ fine
pumice deposited on
surface, partly grass
partly loose shrubby
vegetation.

- 5 21 *Aristida repens* Trin. det. D.M. Porter 1974
common on open scoria rim

- 8 22 *Pomoea cf. alba*
common, climbing on trees
in crater

- 1 23 *Sonchus oleraceus* L.
rare on open scoria rim

- 2 24 *Spermacoce*
rare on open scoria rim

- 1 25 (hepatic)
on shaded overhanging earth bank

- 7 26 *Chiococca alba* (L.) Hitchc.
occasional

almost leafless sprawling
prostrate tangled lactiferous
shrub; petals dark
brown with green margins,
corolla parts pale green,
stigma brownish.

det. D.M. Porter
1974

tufted.

dwarf shrub, erect.

low spreading bushy;
flowers fragrant, white

extensive vine
flowers white, closed
in afternoon, pedicel
inflated.

~~rare~~

glaucous green

small tree 4 m. tall,
flowers yellow.

- 45027 *Zanthoxylum fagara* L. Sarg.
common det. D.M. Porter Dec. 1969
- 7 28 *Waltheria ovata* Cav.
common on outer slopes
- 7 29 *Froelichia nudicaulis* Hook. f. *ssp. lanigera*
common on bare scoria rim
- 7 30 *Cordia revoluta* Hook. f.
common generally
- 5 31 (Comp.) *Blainvillia dichotoma* (Murr.) Stewart
common on scoria rim
- 3 32 *Cyperus aristatus* Rottboell det. Koyama 1974
very local on spot of
pumice on scoria rim
- 4 33 ~~*Lobelia darwinii* Hook. f.~~
Lobelia xalapensis Hook.
common on scoria rim
- 5 34 ~~*Isigone*~~ *Darwiniothaeus tenuifolius*
common on scoria rim
- 1 35 *Cyperus*
rare on scoria rim
- 5 36 *Cenchrus platyacanthus* Anderss. det. D.M. Porter 1974
occasional on slopes
- 5 37 *Gossypium darwinii* Walt
common on outer slopes
near base
- 1 38 *Galactia velutina* Benth.
rare, climbing in bushes
- 1 39 *Lippia*
common on scoria rim
- 1 40 *Salvia*
rare on scoria rim

- small spreading
tree, aromatic when broken,
pinks green.
- det. Porter — shrubs 2 m. tall,
branched from base
flaring at tips, flat-
topped, branchlets in one
plane; flowers yellow.
- (Anderss.) Eliass. — depressed much-branched
(det H. Andersen 1978) shrub.
- det. Porter — erect shrub, mostly
branched at base, 2 m.
tall flowers white.
- flowers white
- shrubs 1.5 m. tall;
disk yellow, rays white.
- culms spreading
depressed.
- shrubs 1.5 - 2 m. tall,
bolls only on dead branches.
- twining, flowers pink,
kee not twisted.
- erect shrub, flowers
pink.
- flowers purplish.

- 45041 *Pectis*? *Chrysanthellum pusillum* Hook. f.
locally common in series in
7 42 (comp.) *Macraea leucifolia* Hook. f.
abundant in series in

same - in open grassy
pumice field.

- 5 43 *Cuscuta gymnocarpa* Engelm. (det. H. Andersen 1978)
common, parasitic
on grasses and various herbs
5 44 *Cyperus anderssonii* Böckeler det. Koyama 1974
common
3 45 *Cyperus ligularis* L. det. Koyama 1974
occasional
2 46 *Chiococca alba* (L.) Blake
occasional
1 47 *Cyperus ~~inermis~~* *Cyperus aristatus*
on top of small exposure
of lava with fine pumice
sand on it.
5 48 *Cenchrus platyacanthus* Anderss. (det. P.M. Porter 1974)
occasional
5 49 *Ipomoea triloba* L.
common
6 50 *Salvia occidentalis* (det. H. Andersen 1978)
common
4 51 *Crotalaria incana* L.
common

(To p. 170)

flowers yellow, plant
without strong odor
sparsely branched
erect to arching shrubs,
2 m. tall; flowers yellow.

- threads dull orange,
flowers white.
1974 - small tufts, culms
erect, spikes green.
- tufts, leaves glaucous;
culms erect, spikes
reddish green.
- shrub 3 m. tall, flowers
yellow, fruits flattened,
immature.

Bottboell det. Koyama 1974

erect, spikelets purple.

- creeping, flowers rose pink,
just beginning to close
in middle of day.
- prostrate with ascending
branches, forming a mat;
flowers pale bluish.
- flowers yellow, flushed
with reddish (but not striate)
outside; pods inflated.

Feb. 6

series of photos on rough
lava and of land iguana.
2 or 3 hot, across pumice.

Apparently more than on
pumice fall

bar cone is complicated
merge into semi-aa with
thin vegetation

Several small grassy
spots on up the slope but
none as large as where we
camped.

Green strip continuous almost
to sea.

East of it at least 7 or 4
ages of flows that have
little vegetation

Where Montelona tussocks
are sparse, mat of Alternanthera
or Rhynechoria fills interstices.
Bare spots where iguanas
sun themselves, and at
mouths of burrows.

D. Carvaquero found young spunt
at edge of rough lava flow
10 m. n. of camp. with many
red ones.

Feb. 6 - left Narborough at
10:45 by helicopter
to Duncan?

South coast of n. w.
peninsula of Albemarle.
gentle slope, dry, open but
of Bursera alternating
with ~~an~~ a deciduous open
scrub. Hard and there darker
green trees mixed with
light green Bursera. Toward
sea the scrub is more
prevalent.

then crossed an area of
green closed to open mixed
forest, some Bursera.

Then a patch of very
rough aa, with some
scattered vegetation.

Then a strip of green closed
low forest, then another
area of very rough aa
with depressions - biquinas
with bright green closed
forest.

then more closed mixed
forest for some distance.
Does not extend to sea, but
gradually fades into deciduous
scrub.

Along coast more and more
dominated by Bursera and
become thinner until it is
an almost leafless open Bursera forest

for a long distance - a few scattered dark green trees in it. Becomes thinner. Ground is somewhat irregular. One area is pale green most gray and leafless. Approaching coast forest gradually fades out, to almost bare, but brown and weathered lava.

A deep inlet in coast with mangrove fringe and a rather extensive patch of mangrove at its head, which runs into a strip of pale green *Bursaria* forest extending inland. Slight mangrove fringe, broken, along coast. In distance considerable mangrove in patches along coast, these extend discontinuously for some distance, backed by a vast lava plain.

Duncan I. - covered by a low deciduous scrub covered by lichens. - arborescent *Opuntia* - scrub of *Croton* + *Prosopis*. Some scrub forest on crater walls. A lot of *Crates* red soil with sparse bushes. Patches of *Bica*

Opuntia near top. The scrub is fairly thick. The yellow rocks seen from ship are lichen-covered.

Narborough I. (ctf.)

Cone & west of Pumice flat - slopes have much fresh pumice, and covered by a scrub of the scarcely branched linear-leaved composite, this from open to tangled. The stems are up to 2 m. long. *Cordia* and *Lippia* scattered in with it. Some *Bursaria* in the little crater. Molluscs in open steep spots. A few large *Cereus* on slopes and top.

Weltheria, especially, tending to invade the pumice, also *Cordia*. The woolly composite is common generally, but abundant locally. Both on pumice and on cones and on lava.

Pealeria mostly on open lava a few on slopes of west cone.

Feb. 6 - ^{Helicopter} Baltra to Academy Bay.
Baltra I. - large
area of exposed red soil
with sparse vegetation.
Also areas, peripheral, of
lava clinker with sparse
vegetation.

Indefatigable - wherever
the shore is low there are
mangrove fringes.

Inland from these wet
areas of lava clinker with
pockets of red soil - sparse
vegetation, mostly *Bursera*. This
gets denser inland. The
patches of red soil get
scarcer and gradually vanish.

Inland there are patches of
red soil, small - that seem
wet. Then none. Pure semi-
open *Bursera* forest for miles.
Still practically leafless.
Until mountains are approached,
when it gradually becomes
greener.

Then a gradual admixture
of other trees and a pair of
collapse craters - as the mo.
saw. Wet forest from here
to Table Mt. Ponds still
have azolla. One wild
cow.

Brown tree mused with
guy (Sealerie). Large area
of forest, some of it not

much disturbed, but
mostly opened up and
with heavy herbaceous
undergrowth.

The gradually fades into
more open deciduous forest,
mostly *Bursera*.

Scrub area only local
around Academy Bay.

Feb. 7 - Academy Bay,
photos of scarp and
cactus skyline on south
side of Bay, also of mangrove
on rock, north side, near
station. (Kod. only.)

Also of Academy Bay settlement.

Left on patrol boat 7 p.m.

Coastal *Cryptocarpus*
scrub extends a mile or so
along the shore from the station.

Then the shore is a low cliff.

On top of this is an *Opuntia* -
Bursera forest with a dry
leafless undergrowth.

The *Opuntia* soon gets
lower. The *Bursera* soon
drops out, the scrub, perhaps
Croton, becomes the dominant
vegetation with considerable
low *Opuntia*. Perhaps a mile
beyond the end of the
Cryptocarpus, or maybe a bit
more, the *Opuntia* becomes

- 45052 *Bouteloua disticha* (HBK) Benth.
det. D.M. Porter 1974
dominant plant
- 53 *Alternanthera filifolia* (Hook.f.) Howell
dominant locally
- 54 *Letaria setosa* (Sw.) Beauv. det. D.M. Porter 1974
very common
- 55 *Cuscuta gymnocarpa* Engelm. (det. H. Andersen 1978)
very common, parasitic on
Rhynchosia and several other
species
- 56 *Bidens riparia* HBK. ?
rare
- 57 *Psidium galapageium* Hook.f.
occasional, scattered
- 58 *Rhynchosia minima* (L.) DC.
abundant locally
- 59 *Cheilanthes microphylla* (Sw.) Sw. det. Porter
very common generally
- 60 (comp.) *Blainvilleria dichotoma* (Murr.) Stewart
occasional
- 61 *Latus*? *Tephrosia decumbens* Benth.
very local
- 62 *Cissampelos pareira* L.
locally abundant
- 63 *Cissampelos pareira* L. ?
locally abundant
- 64 *Passiflora suberosa* L. ?
occasional
- same - on rough aa lava
with little vegetation.
- 65 *Cheilanthes sulphurea*
common in cavities

- det. D.M. Porter, 1975
in small tussocks
culms ascending, spikelets secund.
forming a dense mat,
stems purple.
forming small erect
tussocks.
orange threads; flowers
white.

var. *galapageium*
det. D.M. Porter
Dec. 1969

1974

- young plants only, seen, sterile.
- vine forming mats;
flowers yellow.
rhizomes buried, fronds
erect.
- ~~prostrate~~ prostrate; flowers pink.
- ~~extensive~~ twining vine,
flowers whitish.
- ~~extensive~~ twining vine,
fruit immature.
- det. Porter
climbing bush; flowers
greenish, corona segment
yellow, ~~stamens~~ gynophore purplish,
very green.

= *Notholaena galapogensis* Weatherby & Svens
det. Porter 1974

L5066
5*Physalis pubescens* L.
rare~~67~~ same - in rough as lava
~~that~~ with irregular
woody vegetation1 67 *Lippia neriifolia*
common3 68 *Croton scouleri* Hook. f. var. *scouleri* det. Porter 1974
occasional4 69 *Tournefortia pubescens* Hook. f. (Det. D. M. Porter)
occasional4 70 *Cordia*
occasional5 71 *Tournefortia pubescens* (Hook. f.) (det. H. Anders. in 1978)
occasional3 72 *Cordia leucophytis* Hook. f. (det. H. Andersen 1978)
occasional5 73 (*Solan.*) *acnistus ellipticus*
rare5 74 (fern) *Trachipteris pinnata* (Hook. f.) C. Chr. det.
abundant generally on
rocks.5 75 *Phoradendron hensei*
abundant, parasite on
Euphorbia *bagara*1 76 *Polypodium*
on dead wood5 77 *Cyperus brachystachys* Anders.
common *Cyperus anderssonii* Böckler
det. Koyama 19741 78 *Polypodium pectinatum* L.
locally common on rocks1 79 *Commelina diffusa* Burm. f.
occasionalflower yellow with fine
brown rectangles at base
of corolla lobes.

small shrub.

shrub 3 m. tall.

shrub 2 m. tall; flowers
white.- tree 4 m. tall; flowers
white.- small tree; flowers
white.

- shrub 2.5 m. tall

- flowers white.

small tree about 4 m. tall,
flowers white, fruit green.

Porter 1974

green, spike ~~and~~ dark reddish,
fruit white.yellowish white above,
white below, partially
resupinate.small tufts, spikelets
green.- *Polypodium dispersum* A.M. Evans det. Porter 1974

det. Porter

prostrate, flowers white.

174

1964 Galapagos Is.

45030 *Bursera graveolens* (HBK) Triana.
common 6 Planch.2 81 *Lida spumosa* L. (det. H. Andersen 1978)
rare3 82 *Phyllanthus* carolinensis Walt.
common subsp. carolinensis
det. D. M. Porter 19742 83 same - in open pumice field
Oreocarya cf. saxicola
occasionalFeb. 5 - same loc. on side
of small cone covered
by pumice, with some
lava rock exposed.5 84 *Dodonaea viscosa* L. var. *spatulata* (J.E. Sm.) Benth.
rare det. D. M. Porter 19704 85 *Phoradendron*
occasional, parasitic on *Zantho-*
xylum *paganum*1 86 *Galactea velutina* Benth.
rare1 87 *Vigna luteola* (Jacq.) SONS.
rare det.

2 88 (moss)

3 89 *Phoradendron*
parasitic on *Lippia*1 90 *Spermacoce*
very common in scrub5 91 *Mollugo* *snatgrassii* Robins (det. H. Andersen 1978)
occasional in open places2 92 *Cordia revoluta* Hook. f.
common

Narborough I.

175

stem tree 5 m tall,
bark white, smooth.
flower range calyx
with reddish sulci.
branches more or less
in one plane.tree with definite trunk,
ripe fruit spherical,
greenish.shrub 3 m. tall.
plant dark reddish green.

flowers pink

flowers yellow, keel
not twisted.~~shrub~~ plant dark
reddish green.
dwarf shrub, prostrate
to erect; flowers 4 parted, white.
flowers white; rosette
leaves gone from most plants.
shrub, flowers white, tubular.

det. Porter

176 1964 Galapagos Is.

- 45093 *Phoradendron*
parasitic on *Cordia*
- 1 94 *Phoradendron*
parasitic on #45096 (*Lipochlaena*?)
- 5 95 *Baccharis gnidiifolia* HBK det. Porter
rare
- 2 96 (comp.) *Mouraya loricifolia* Hook. f.
abundant
- 3 97 *Polypodium tridens* Kunze det. Porter 1974
very common terrestrial
- 1 98 (arclaf.) *Sarcosseto sarcostemma angustissima* R.W. Holm
(det. Andersen 1978)
occasional
- 5 99 same - in pumice field
Cordia revoluta Hook. f.
common

Feb. 6 Duncan I.

- 45100 *Croton scouleri* Hook. f. var. *scouleri* det. D.M. Porter 1974
common in low thin scrub

Feb. 6 Academy Bay
~~Santa Cruz I.~~

- 01 *Portulaca lutea*
planted from material
collected on Plaza I., off
coast of Indefatigable
by Dr. Wildfrow.

Narborough I. Duncan 2 177
Indefatigable 2

plant ^{dark} reddish green

plant dark reddish green

shrub 1 m. tall

sparsely branched
erecting shrub 1-1.5 m.
tall, head yellow.
fronds erect.

almost leafless, tacitferous
Twining, corolla segment
dark brown with green
margins; corona very pale
green.

erect, fountain-like shrub
with many stems from
base, 2 m tall. flowers
white, tubular.

shrub 1 m. tall, sterile.

8-10 m.

stems ~~erect~~ ascending,
red above, gray-brown
below; flowers 5 cm. across,
petals emarginate.
stamens 38-45, stigma
4-5. Flowers and plant
said to have been much smaller in
wild state.

Feb. 8 Academy Bay

- 45102 *Crocarpus erectus* ^a L.
edge of mangrove
- 2 03 *Laguncularia racemosa* (L.) Gaertn. f. det. D.M. Porter Dec. 1969
edge of mangrove
- 2 04 *Maytenus octogona* (L'Her.) DC. det. D.M. Porter 1970
Celastrus
common in coastal scrub
- 5 05 *Croton scouleri* Hook. f. var. scouleri det. D.M. Porter 1974
common in coastal scrub
- 1 06 *Hippomane mancinella* L.
common in coastal scrub
- 5 07 *Hibiscus tiliaceus* L.
very local in coastal scrub
- 5 08 *Sesuvium* ~~*portulacastrum*~~ ^{*portulacastrum*} L.
common along seashore
- 5 09 *Croton scouleri* Hook. f. var. scouleri det. D.M. Porter 1974
common in coastal scrub
- 5 10 *Croton scouleri* Hook. f. var. scouleri det. D.M. Porter 1974
common in coastal scrub
- 1 11 *Croton scouleri* Hook. f. var. scouleri det. D.M. Porter 1974
common in coastal scrub
- 5 12 *Cordia*
rare, near Nelson house
- 1 13 ~~*rare as to*~~ *Lycium*
rare on bare rock
- 1 14 *Mesembryanthemum*
planted in Nelson yard

2 m.

shrub 1.5 m tall.

small tree 4 m. tall.

shrub 2 m. tall.

slender tree 4 m. tall.
scouleri det. D.M. Porter 1974lactiferous, poisonous,
small tree.— small tree, flowers
bright yellow, in
afternoon turning reddish.
— prostrate stems
reddish, leaves dull.
— flowers pink.
— shrub 3 m. tall.

shrub 3 m. tall.

shrub

— shrub 1.5 m. tall, flowers
white, fruit red.
— shrubs, flowers white.prostrate to ascending,
very fleshy, flowers
deep orange.

1964 Galapagos Is.

Birds seen in
Harborough at 1000'.

doves

mocking bird

Barn owl

hawk

Vermillion flycatcher

phoebe-like flycatcher

with yellow belly

finches of a number

of kinds incl. warbler finch

~~owls~~

Birds seen on Indefatigable?

Brown pelican

Lava gull

Fregatta minor

Curlew

Ruddy turnstone

Mangrove warbler

Vermillion flycatcher

Short-eared owl

various finches

Mocking bird

green heron

Great blue heron

very sparse and soon essentially disappears, leaving a plain. This is just about opposite Jensen Island. The latter is mainly covered by *Cryptocarpus* scrub, with a clump of a deciduous scrub near center, several white beaches and low dune. A brackish pond with green algal, acc. On, who, with Pea Man, brought some plant scraps.

On mainland, the scrub forms a zone extending a bit back from the cliffs. From the cliffs taper off and there are stretches of white beach extending between bits of rocky shore. Not far inland the *Bursera* forest with some *Opuntia* gradually takes over. It is a bit green. The narrow deciduous scrub zone extends almost to the point, backed by *Bursera* *Opuntia* with deciduous scrub understory. The point is rocky and very sparsely vegetated. The second small headland

is also rocky but more or less covered by a low yellow-green shrub - also seen on the rocky shores back by the beaches.

Back of this is deciduous scrub with scattered *Opuntia*. Just beyond it, *Opuntia* forest. Back of this and extending up to the foot of the steeper slope is a green forest of *Bursera* with scattered *Opuntia*.

This gradually fades into the vast *Bursera* plain on the north side. Some mangroves locally along the shore, bits of white beach. Several small cones in this plain, covered closely by *Bursera* forest, but here very sparse. The dark red substratum shows through. The larger cone does not show this sparseness.

Considerable *Opuntia* in this forest.

Patches of mangrove occupy a considerable proportion of this shore. No cliffs here but rock alternating with beach.

On cliffs on n.e. corner of
Seymour (Baltra) a few
plants of *Scalesia crockeri* (coll. by D. Snow), previously
known only from a few
plants on north Seymour cliffs.
Here mostly in poor condition, acc.
to Snow.

Feb. 8 - crossed Salinas point.

Vegetation definitely brown, mostly savanna, E. of Santa Elena.

Conspicuous erosion.

Only distal part of ^{peninsula} visible - the rest foggy.

Inland the landscape is quite green. - savanna open forest and thicket, some cultivated patches - these bright green.

Denser forest farther inland, continuous over fairly large area, rather hilly land.

Looks rather secondary, but this may be because of its seasonal character.

Then cultivated patches are more frequent. Rio Guayas visible far ahead. Country quite hilly along course - Manabi hills? Forest is very green and closed.

As Guayas is approached more and more cultivated patches and more evidence of shifting agriculture. But some substantial patches of what appears to be rather undisturbed forest.

Then large mass of bright green marsh or

wet savanna with winding tidal channels lined by ~~swamp~~ ^{swamp}, then a vast area of swamp with only a few areas of dry land, great intersecting channels, a few bare spots with no vegetation, Batis? around edges.

Swamp stretches southward from large shabby area of extensions of Guayaquil. Then the City, itself.

Wooded hills just to north and west of it.

Feb. 9 - trip, Guayaquil to
Playas

In Guayaquil - street trees
Washingtonia cf. robusta
Cananga odorata
Pithecellobium pauciflorum
Cassia cf. n. sp.
Setonix regia
Spathodea campanulata
Ficus microcarpa
Roystonia oleracea
Terminalia catappa

Sedimentary hills
 in first several km.
 covered by secondary
 thickets, tangled with
 vines, some slopes with
 grass and scattered trees.

Landscape green Dec. 5 March
 & April, completely dry the
 rest of year. Rainfall varies
 enormously year to year.

Beyond this hills covered
 by secondary savanna and
 open forest with spaces between
 trees occupied by broad-leaved
 herbs & vines, shrubs, etc.

Savanna character becomes
 rapidly more pronounced westward.
 Great ^{Peiba} *Bombax* reuff. becomes
 common. At about km 40
Acacia comes in and soon

becomes abundant.

Near road much of
 land is cleared and
 cultivated. Much
 burning.

Xerophytic character
 increases, and at about km 60
 columnar *Cereus* appear.
Prosopis abundant.

Progress. Turn off toward
 Gulf of Guayaquil, to s.w.
 Vegetation here is an open
 scrub forest with many
Cerei - most or all species
 deciduous. *Cordia lutea*
 common. Microphyllous
 component very important.
 Spacing in places
 quite close. In places
 dominantly microphyllous
 small trees or large
 shrubs with scattered
 huge *Bombracaea*.

A large *Hymenocallis* or
Pancratium is common
 locally in more open
 places.

This vegetation is generally
 rather tangled with vines.

Becomes lower and locally
 very open to south, on rolling
 low hills. *Cereus* becomes
 very common locally.
 Km. 78.

heights only 2-4 m. for most component, the *Cereus* and *bombacaceae*, a few other trees, taller.

General vegetation more and more leafless - scattered trees coming into leaf. Larger ones esp. *Bombacaceae* fully leafed out.

About 1 km from coast landscape is greener - open forest & savanna. Very little herbaceous growth. Stature varies locally. number of cacti also.

Large open areas with only scattered shrubs. Sheet erosion very evident. Thin grass on perhaps $1/4 - 1/2$ of the ground. Locally areas of scrub with scattered trees, or of open forest with shrub understory. Playas. Diffuse town of small houses and shacks.

East along beach, for some distance summer cottages abundant.

Beyond these a long strip of sand with scrub lying between Data Lagoon and sea.

Broad flat belt of completely bare salt encrusted soil back of mangroves (photo)

entrance to Data Lagoon. Mangroves line entrance. Low scrub with, some small *Prosopis*, etc.

few *Coconuts*.

Scrub is of *Cordia lutea*, *Valleria*, *Acacia* sp.

Lantana, etc. Toward beach *Cordia* is ~~abundant~~ in pure stand. I intend

this, a zone of sparse *Ipomoea per-caprae*. (photo - red)

This scrub is discontinuous each spreading shrub having piled up a small dune of quartz sand around itself. The tops are largely dead, active growth and flowering around periphery. photo.

Inland a few yards a few patches of reeds and a bush of *Valleria*. A small colony of *Lantana*.

On opposite side of channel of lagoon is a strip of mangrove - almost pure *Rhizophora*, except a few scattered *Avicennia*.

Acacia scrub forms a very flat, very spiny mat.

The lagoon has mangroves in the area toward the mouth, with a rather narrow saline bare zone between the mangrove and the higher ground. Westward the saline zone becomes rapidly broader, near western lobe no mangroves at all, but wide areas of salt flat with herbaceous vegetation around margins.

In thin but closed forest (72.5 km.) bet San Antonio and Progreso *Carica paniculata* - rare along road. (km 73) *Hymenocallis* sp. very common.

Progreso to Salinas

semi-open to closed scrub forest, deciduous many trees now leafing out. *Cereus* almost absent.

About km 78 the scrub forest thins to a savanna with some bare bushes in the open spaces.

Cereus become abundant at about km. 81.

Trees become farther and farther apart bare shrubs more abundant.

General aspect becomes more sparse and leafless (km. 95)

Mts. to left are green and wooded.

About km. 96 large areas as actual desert with bare ground, scattered bushes. Some distance from highway appears to be savanna with thin low grass.

About km. 100 the ground is higher and varies from savanna to scrub forest. Alluvial hills.

Beyond this a rather open savanna. This becomes gradually more sparse and desert-like. Few shrubs ^{green} trees.

Beyond crossroad to much of country is true desert. Sheet erosion is very evident.

Km. 115.

About km. 116 bushes become more abundant to form a leafless open scrub about 1-1.5 m. tall. Small area is much dug up for gypsum (?) ^{used in making cement.} ~~crushed~~

One area here green with *Cryptocarpus*.

Scrub thins out some. (to p. 194)

Feb. 9 - mouth of Data Lagoon,
e. of Playas
on sand flats back of beach

- 45114^a *Cordia lutea* Lam.
dominant in open scrub
2 15 *Acacia*
common component of scrub
1 16 *Ipomoea pes-caprae* nesp. *basiliensis*
in open loose sand
2 17 *Vallesia*
common in open scrub
2 17a *Leutia*
common in scrub
Feb. 9 - bet. San Antonio and
Progreso, km 72-73 on road
to Playas from Guayaquil
edge of open scrub forest
1 18 *Tymenocallis*
very common locally
3 19 *Carica* ~~*parviflora*~~ *parviflora* (A. DC.) Solms
rare

Feb. 9

on coast east of Santa Elena

- 1 20 *Lycium*
common in low scrub

1-2 m.

spreading shrub; flowers
bright yellow; fruit white, fleshy.
shrub up to 2 m. tall,
flowers orange-yellow.
sterile, seeds from sand surface.

(L.) v.
ontata.

shrub 1 m. tall, flowers white.

shrub 2 m. tall, stems and
spines green, flowers yellow-green,
ripe fruit red, most fruits immature.

flowers white.

unbranched, 1 m. tall
cyme and buds red inside
of corolla pink.

3 m

rigid shrub; flowers white.

Km. 124-5 desert with sparse low shrubs. *Acacia* locally common. More vegetation near Santa Elena.

East from Santa Elena, over low hills with sparse scrub, down to sea. Road along beach ridge. Back of beach ridge an enormous silt flat, bare with mats of ~~*Euphorbia*~~ *Maytenus*. Beyond this low bare hills of silt or siltstone. Sparse scrub. Some arborescent *Cerei*.

These are along coast. Vegetation a depressed open scrub of *Maytenus* and *Lycium*. Some taller shrubs and *Cereus* back from shore on hills. Flats salt crusted.

Bare silt flats, on way back, examined very quickly. friable cracked silt. Locally a few small *Evolvulus* sp. otherwise no vegetation.

On slightly higher (a few cm) ground, *Maytenus* with very thick leaves, trees held vertically and a few bushes of *Lycium* and *Laguncularia* (?) very depressed.

(Photos - Kod.)

one label unless otherwise noted

Galapagos

Plants collected by Allyn Smith

Tower Island, Jan. 30, 1964

1 *Opuntia*

2 *Opuntia*

Jensen I., off coast of Indefatigable I.
Feb. 1964

3 *Lycium*

4 *Sesuvium portulacastrum* L.

5 *Portulaca lutea* L.

6 *Heliotropium curassavicum* L.

Plants collected by David Cavagnero

Narborough I., green strip on SW slope

Feb. 4, 1964

1 *Asplenium*

Inside tiny water on walls of shady damp lava
2500 ft.

2 *Sarcosola oleacea* L.

On pumice in *Polypodium* zone 2500 ft.

3 *Desmodium*

Polypodium fern zone, 2500 ft. Flowers pale blue

4 *Psilotum nudum* (L.) Beauv.

2500 ft

5 *Nephrolepis*

2500 ft

6 *Blechnum occidentale* L.

2500 ft

7 *Adiantum*

2500 ft

8 *Asplenium*

2500 ft

9 *Asplenium*

2500 ft

~~*Polypodium*~~ most common fern on all floors

- 10 *Pteridium aquilinum*
common only in depression where moisture collects
2500 ft

- 11 *Thelypteris*
2500 ft

- 12 *Asplenium*
2500 ft

- 13 *Asplenium*
2500 ft

- (2) 14 *Pityrogramma calomelanos*
2500 ft

- (3) 15 *Polypodium*
3000 ft most common fern on old flows, chief
ground cover in wet areas high up.

- 16 *Cyperus recurvus*?
3000 ft on pumice sand of old land - iguana run

- 17 *Polypodium*
3000 ft epiphyte on *Zanthoxylum* sp.

- 18 *Eragrostis*
2500 - 4800 ft

- 19 (comp.)
2500 - 4800 ft

- 20 *Eragrostis*
2500 - 4800 ft

- 21 *Spermatophyte*
2500 - 4800 ft

- (2) 22 (comp.)
2500 - 4800 ft

- 23 *Mollugo*
2500 - 4800 ft

- 24 *Spermatophyte*
4800 ft

- (2) 25 *Solanum*
4800 ft large clumps growing at edge of Scaevola zone, on

deep ash sand near water rim

26 (lichen)

Plant collected by E. Yale Dawson

24951 *Euphorbia*
Alingdon I. ~~shore~~

shore, 25 Jan. 1964

24952 *Candelia*?
26 Jan.

(2) 24953 *Prosopis*
near shore. 26 Jan. prostrate

24954 *Alternanthera echinocephala* (Hook. f.) Christ.
near South shore. 26 Jan.

24955 *Waltheria*
South shore, 26 Jan.

(2) 24956 *Coldenia*
S. shore 26 Jan.

24957 *Ipomoea*
S. shore 26 Jan.

(2) 24958 *Bindloe* I.
Jan. 26

(2) 24959 *Waltheria*
Jan. 26

(2) 24960 *Coldenia*
Jan. 26

(2) 24961 *Croton*
Jan. 26

(2) 24962 *Euphorbia*
Jan. 26

24963 *Cordia lutea* Lam.
Jan. 26

24964 *Euphorbia*
Jan. 26

200

24965

(1)

#

Spermacoce

Jan. 26

24966

Ipomoea

Jan. 27

James Island, James Bay, Jan. 27

24967

(Asclep.)

24968

Opuntia

(1)

(1) 24969

~~Scutia~~
~~Dioscorea~~

(3)

(3) 24970

Tournefortia

(3) 24971

Acacia

(1) 24972

Bursera

(1) 24973

"Lipochaeta"

(1)

(1)

Bruunberg, S. & Petersen, C. G.

Rundt, jorden rundt på tornannshånd.
1-254 Oslo, 1960.

Account of voyage, including
visit to Farman and Gao Keling
in Norwegian.

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COX, Allan
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MACKAY, Stuart
MARTIN, Edgar
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MILLER, Robert
MURPHY, Jack
NAHMMACHER
ORR, Robert
ORTIZ, Fernando
QUEVEDA, Alejandro
QUINTERO, Pilar
PALMER, Clarence
PAPENFUSS, Ted
PERLMAN, David
PYLE, Robert
RICK, Charles
ROBLIN, Alfred
RODRIQUEZ, Gladys
SCHUSTER, Robert
SILVA, Paul
SMITH, Allyn
SNOW, David
STEBBINS, Robert
STEPHENS, Stanley
TORY-PETERSON, Roger
USINGER, Robert

VAN STRAELEN, Victor
VERCAMMEN*GRANDJEAN,
WALKER, Boyd
WEBER, William
WHITNEY, Pete
WIGGINS, Ira
WILLIAMS, Howel
ZULLO, Victor

1/22 dinner

Dawson

- 20959 - *Waltheria*
ovata Cav.
24972 *Castela galapageia*
24978 " "
24975 *Waltheria ovata*
24969 *Lentia pauciflora*
(Hook. f.) Wedd.
24972 *Bursera graveolens*
(HBK) Triana & Pl.

Loveque

- 34 *Canna lambertii* Lindl.
182 *Waltheria ovata*
111 *Passiflora colimauensis* Wieg.
170 *P. foetida* v. *galapagensis* Kelly.
118 *Capraria peruviana* Benth.
32 " "
29 *Erythroxylon weberianum* Garay
176 *Habenaria monorhiza*
(Hb.) Reiche f.
134 *Lentia pauciflora* Hook. f.
155 " "
74 *Solanum americanum* Mill.
49 *Datura innoxia* Mill.

U S.

Josberg. coll.

Galapagos

Rubiacaceae

Ceylon

Josberg 1970

Labels in

USS PINE ISLAND (AV-12)

2 February 1964

Tentative Helo Flight Schedule for the period 2-10 February 1964 in support of the National Academy of Sciences Project, Galapagos.

All flights except 2 February will depart Isla Baltra at 0900s and return to Isla Baltra at about 1130s daily.

SUNDAY - 2 FEBRUARY

- a. 0600 - take off. Clockwise circles of Roca Redondo, N.W. tip Albemarle, and land at Punto Espinoza. Pick up 3 people (Usinger, Schulke, and Perlman). Return to ship via N. Albemarle.
Starting from ship: Cohen, Bowman, McBirney, Fosberg.
Return 0730.
- b. 0830 - take off to Punto Espinoza, drop Billeb and pick up Kiester.
Recon. of S. Narborough and supply drop; then return Baltra.
Starting from ship: Hendrickson, Billeb, Dawson, Williams.

MONDAY - 3 FEBRUARY

0600 - take off.
To S. Narborough and drop off Hendrickson, Kiester and Fosberg.
Starting from Baltra: Hendrickson, Kiester, Fosberg, McBirney (returns to Baltra.)

TUESDAY - 4 FEBRUARY

0900 - take off.
To Jervis and drop off Dawson, then to Punto Espinoza and drop off Cox; return to Baltra.
To S. Narborough and drop off Ashlock and Cavagnaro; pick up Dawson from Hervis and return to Baltra.
Starting from Baltra: Dawson (returns), Cox, Ashlock, Cavagnaro.

WEDNESDAY - 5 FEBRUARY

0900 - take off.
To Punto Espinoza, pick up Cox and Billeb; on to Cape Berkeley and drop off Williams, McBirney and Cox; return to Baltra with Billeb.
Starting from Baltra: Williams, McBirney.

THURSDAY - 6 FEBRUARY

0900 - take off.

To Cape Berkeley and pick up Williams, McBirney and Cox; then to Togus Cove to drop off above 3; then to S. Narborough to pick up Fosberg; Cavagnaro, and Ashlock; then to Duncan and drop off Cavagnaro and Ashlock; then to Academy Bay for drop off of Fosberg and Billeb.

Starting from Baltra: Billeb.

FRIDAY - 7 FEBRUARY

0900 - take off.

To Togus Cove and pick up Williams, Cox, and McBirney; then to Jervis and drop off there 3.

Start from and return to Baltra empty.

SATURDAY - 8 FEBRUARY

0900 - take off.

To Jervis and pick up Williams, Cox and McBirney; then to Duncan, drop Cox and Williams and pick up Ashlock and Cavagnaro; then to N.W. corner James and drop off McBirney, Cavagnaro and Ashlock.

Starts from and returns to Baltra empty.

SUNDAY - 9 FEBRUARY

0900 - take off.

To Duncan and pick up Williams and Cox; then to N.W. James, drop off Cox and pick up Cavagnaro and Ashlock; then drop off Williams, Cavagnaro and Ashlock at Academy Bay.

Start from and return to Baltra empty.

MONDAY - 10 FEBRUARY

0900 - take off.

To S. Narborough and pick up Hendrickson and Kiester; on to N.W. side of James and pick up McBirney and Cox.

No scientists start from ship; all 4 are picked up and returned.

Brunborg, E. & Petersen, C. E.

Rundt, jorden rundt på tomannshånd.

1-254 Oslo, 1968.

Account of voyage, including
visits to Tuamotus and Cook Keeling,
in Norwegian

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